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WILSON ORNITHOLOGICAL CLUB

THE CONDOR

A Magazine of Western
Ornithology



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Number 6



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THE CONDOR

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THE CONDOR

VOLUME XLI

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OBSERVATIONS ON BREEDING BEHAVIOR IN TRICOLORED RED-WINGS

By DAVID LACK and JOHN T. EMLLEN, JR.

The following incomplete observations, made in the Sacramento Valley of California in May, 1939, seem worth publishing since so little is on record of the remarkable behavior of the Tricolored Red-wing, *Agelaius tricolor*. Intensive observations for several hours each day after dawn were made May 13 to 16, 1939, from a high bank overlooking a colony of some 2000 birds in cattails at Willow Slough, near Davis, Yolo County, and this colony and four others near Marysville, Yuba County, were visited at intervals in May and early June.

As a general rule, related species of birds show very similar behavior. The nearest relative of *A. tricolor* is the Red-wing, *A. phoeniceus*. From observations by Allen (1914), Noble and Vogt (1935), Linsdale (1938, pp. 127-156), and the present authors, it is clear that the Red-wing, *phoeniceus*, is territorial. The males of this species arrive before the females and each defends an isolated territory by fighting, by threat display with erected red epaulets (Noble and Vogt) and by "pointing" (personal observation). The male sings from prominent perches and also in aerial song-flight; in either case the epaulets may be erected. Each male frequently has several females, which show no territorial behavior. Courtship includes sexual chases, which often extend beyond the territory (Allen), and singing to the female on the ground with arched wings and erect epaulets (personal observation). Much of the feeding is done far outside the territory, which is the male's display center and within which his females nest.

A. tricolor, by contrast, is perhaps the most colonial of all passerine birds. Neff (1937) found colonies of less than 100 birds rare; most of them consisted of several thousand individuals and some included over 200,000. Dawson (1923) and Neff (1937) adequately describe the amazing density of the nests. We found two adjacent nests with their grasses interwoven, and another occupied nest with a second three inches above it. The species is social from preference, for although potential nesting sites over water are local, the birds are even more local. Under such circumstances, how does the breeding behavior of *tricolor* compare with that of its territorial relative?

Arrival at the nest site.—The Willow Slough colony was established before our observations started, so we have no data on the manner of arrival of the birds. Neff (1937) records cases where both sexes arrived in large numbers together and promptly started to nest. We would guess this to be the usual procedure, and therefore strikingly different from that in *phoeniceus*.

Territory, threat display and song.—Intensive watching in an *uncrowded* portion of the Willow Slough colony showed that each male held a territory some six feet square, to which it usually confined its movements when in the colony, in which it sang and courted, and from which other males were driven out. An immature male was once tolerated in an adult's territory for two minutes, but it was promptly driven out when a female arrived. Fighting never seemed serious and boundary demonstrations, so

common in typical territorial birds, were not seen. At times when another male settled close, or flew low overhead, the owner would draw in its head and partly raise its epaulets—an unmistakable threat display, but rather feeble and not very common. The song, which is similar to that of *phoeniceus* but feebler, was uttered chiefly by males when perched alone. The thousands of songs from the colony blended into a confused babel. Territorial song flights were not seen. (Song also accompanied display to the female, as noted later.) In one instance, when an owner (A) departed for a time, a neighboring male (B) promptly took over his territory, courted a female there and even chased away an immature male. When another adjacent male (C) left, B also paid a short visit to C's territory.

The above observations were made during building and laying, some days after the colony was established. Possibly territorial behavior is more intense earlier, but our general impression is that territory, fighting, threat display and territorial "advertising" song, though definitely present, are feebly developed in *tricolor* as compared with *phoeniceus*, and perhaps are in process of disappearing in the evolution of the species. We were, indeed, unable to distinguish separate territories in the central part of the Willow Slough colony, where the population was denser. Whether this was due to difficulties of observation or to complete suppression of territorial behavior, we cannot say.

Courtship.—On May 13, females were continually flying in with building material. Some were building seriously, while others seemed to have no fixed nesting sites and would fly from one place to another and eventually drop their material. Frequently, on the arrival of a female in a territory, the resident male would expand and arch his wings downward, exposing the epaulets, and spread the tail; sometimes he also raised and lowered his wings or sang. Often, he would then flutter slowly down into the cattails until out of sight. This is a remarkable action for a courting bird, but the female sometimes followed, and his behavior presumably influenced her selection of a nest-site and mate. The arrival of certain females would greatly excite several males, while that of other females (already mated?) did not.

Both male and female often showed similar raising and lowering of expanded wings and tail as a preliminary to copulation. When inviting the male, the female usually arched the body and pointed the beak vertically upward, sometimes quivering the wings or raising and lowering the beak. In many species of birds, other males tend to rush up and disturb copulation if they see it; this was not noted in *A. tricolor*, which is just as well, in view of the proximity of the males. Once, from a tree in the colony, a male flew down in song and with expanded wings to copulate with a female below; this is the only case we observed of an aerial song-flight.

Polygamy and promiscuity.—As in *phoeniceus*, polygamy seems the rule. Of three males in contiguous territories with known boundaries, two had three and the other had two building females; laying occurred in seven of the eight nests. Occasionally a male displayed to two females in quick succession. All the females laid at about the same time. The females usually ignored each other, but occasionally chased each other short distances.

At times, two males were seen displaying to the same female, but usually one, the trespasser, was chased away. As already noted, in an owner's absence, his neighbor trespassed and courted one of his females. One female, which was individually distinguishable, returned with building material when her own male was absent; the next-door male postured sexually, whereupon she flew over to his territory and both displayed. Her own male then reappeared, and she returned and displayed with him. In neither case did copulation follow. These incidents suggest that promiscuity may

occur at times, but polygamy, not promiscuity, would seem the rule where we watched; we do not know that this is true for the denser parts of the colony. Allen (1914) saw a female *phoeniceus* copulate with two males in turn.

Immature males.—Males which had dull epaulets, and which we presume were year-old birds, usually showed no restriction to definite territories. As a result they were repeatedly chased away from occupied ground by adult males. These immature birds frequently dashed in and, without preliminary display, tried to copulate with females; the latter usually took to flight, so that vigorous chases resulted. When a taxidermic mount of a female was provided in an adult's territory, an immature male dashed in and copulated, then as hastily retreated.

The sexual chases characteristic of *phoeniceus* are not commonly observed in *tricolor* colonies; they would cause chaos if they occurred. All chases observed at the colony were by immature males save for one instance when an adult male pursued one of his neighbor's females.


Courtship away from the colony.—Occasional song, courtship displays and sexual chases were seen in the large mixed flocks that were feeding in rice fields away from the colony. Also, two males sang, displayed, and pursued females in a grassy field where large numbers of females had assembled to gather nest material eighty yards from a large colony. Dawson (1923) considered that the normal courtship procedure was for the males to gather in trees away from the colony and for the females to visit them there. Males frequented a group of willows and cottonwoods fifty yards from the Willow Slough colony, but we saw no evidence of extensive courtship there. Copulation was once recorded in one of a group of trees on the border of the Willow Slough colony, but this was conceivably on the edge of a male's territory. From present evidence, we consider courtship in the colony to be the rule, outside it the exception. The occurrence of the latter is, however, of great interest, since it bridges the gap between territorial Icteridae and the colonial Boat-tailed Grackle (*Cassidix mexicanus major*) which normally courts away from the nesting colonies, though occasional males show territorial behavior (McIlhenny, 1937).

Building, incubation, and feeding of young.—In *tricolor* only the female builds and incubates. As soon as incubation commences, courtship ceases and almost all the males leave their territories. During much of the day they are well away from the nesting colonies, but, at least at Willow Slough, large numbers returned to roost at dusk, not in their former territories, but together in a group in a nearby part of the slough; this behavior is in marked contrast to that in *phoeniceus*.

Both sexes fed the young, thereby presenting a parallel with the colonial-nesting Rose-colored Pastor (*Pastor roseus*) of Europe, in which males return to the colonies to feed young after an absence during the incubation period (Serebrennikov, 1931). After leaving the nest, young Tricolors gather in large groups and beg from adults indiscriminately; parents presumably feed any young birds. In one colony at this stage, some females were building and laying, presumably for second broods.

The incubation period, determined by comparing the stage of development on various dates through May and early June in each of four colonies, is about eleven days, the fledging period thirteen days.

Simultaneity of breeding.—Dawson (1923) and Neff (1937) have commented on the remarkable simultaneity of breeding in small colonies of *tricolor*, whereas in larger colonies different sections may be in rather different phases of the breeding cycle. One colony examined by Tyler (1907) was most advanced centrally and least advanced peripherally, with intermediate stages in between. At Willow Slough on May 13, almost



every female seemed to be building or laying; on May 16, all were laying or incubating; the young hatched between May 22 and May 27.

Three other colonies were examined on May 16. At one (Hammonton B) all the birds were building, laying, or had just completed clutches. Of a sample of 51 nests here, 19 were partly built, 11 had one egg, 8 two eggs, 10 three eggs, and only 4 had four eggs. At a second colony only 1.3 miles distant (Hammonton A) 35 nests had eggs well advanced in incubation and one held newly hatched young; 16 empty, presumably deserted, nests completed the sample of 52. At a third colony, some 6 miles distant (Reed's Creek), of 44 nests examined, 4 had well incubated eggs, 13 had both eggs and hatching young, 19 had young just hatched, 3 had young two days old, and 5 were empty. Another part of this same colony was rather more advanced. This simultaneity was rechecked on a later visit to all the afore-mentioned colonies on June 2. At the first (Hammonton B), all of 120 nests that were examined either contained young about 2 to 6 days of age or they had been deserted. At the second (Hammonton A), 163 nests had been evacuated by fledglings, one still contained young, 22 had fresh eggs (second broods), and 6 were deserted. At the third colony (Reed's Creek), all young were out of the nest, some being able to fly.

Lack (1933) has discussed some of the psychological factors affecting breeding time in birds. The above data show that social behavior must be added to these. With three colonies only a few miles apart, the differences in breeding time (synchronous, however, at each colony) cannot possibly be due solely to physical factors acting on the birds' physiological state. Such synchronous breeding also corroborates Darling's observations on *Larus* (1938) that breeding time is most closely synchronized in large colonies. *A. tricolor* does not show the "contagious" courtship behavior described in *Larus argentatus* by Goethe (1937) and Richter (1939). Linsdale (1938) and McIlhenney (1937) give evidence for simultaneity of nesting in the colonial icterids, *Xanthocephalus xanthocephalus* and *Cassidix mexicanus*, respectively, but, as is to be expected, it seems absent in the more closely related, but non-colonial *Agelaius phoeniceus* (Allen, et al).

Mass destruction of eggs.—One colony near Marysville was reported to contain about 60,000 birds up to May 12. At the time of our first visit on May 16 only a few hundred were left. An examination of about one hundred nests revealed that more than three-fourths contained freshly broken eggs or minute shell chips; only a few were undisturbed and these latter contained freshly laid eggs. On June 2 no adult birds were seen in the vicinity; of 114 nests examined, 62 contained shell chips, 46 others were empty and 6 contained newly-hatched, but dead, young. Some of the nests showed small holes in the lining, as if made by birds' beaks.

Another instance of mass desertion and egg destruction occurred at the Willow Slough colony. Some 2000 birds were present there from May 10 to 16; on May 25 there were only about 250, and on May 30 only about 40; these were carrying food to young. Examination of nests in the colony on this latter date showed that many of them had been disturbed; the eggs were broken and the linings deranged.

Neff (1937) has reported several instances of wholesale desertions in Tricolor colonies, but no egg destruction. A colony described by Evermann (1919) was suddenly and almost completely deserted shortly after laying had occurred. Many of the nests were left with bits of broken egg shell much as we observed them at the Marysville colony; the destruction was attributed to skunks. Mailliard (1900) has described a colony which contained many abandoned nests, some with broken eggs. He suggests that the rapid growth of the tules in which the nests were situated may have caused

desertion of early (low) nests in favor of higher building sites. The destruction of exposed nests he attributed to Swainson Hawks (*Buteo swainsoni*) which abounded in the neighborhood. Neither predators nor signs of predator activity were apparent at either of the disrupted colonies under our observation. The egg destruction appeared to be bird work, probably of some moderately small species, and all available evidence seems to indicate that the members of the colony deserted en masse, first eating their own eggs. McIlhenny (1937) reports that adult males of *Cassidix* will occasionally eat nestlings in the colonies of their own species.

Sex ratio.—Males appear to predominate in the colonies during nest building and laying because they perch higher and because many females are away collecting building material. However, actual counts at Willow Slough showed at least equal numbers of the sexes, and sometimes up to two females per male. During incubation, the males disappear, and counts at various colonies revealed around twenty females to each male. Neither stage is satisfactory for estimating the true sex ratio. Perhaps a better time is when the young have hatched and the males are helping to feed. Counts in one colony (Reed's Creek) with newly hatched young on May 16 gave 149 males to 315 females, that is, 47 males per 100 females; on June 2, counts of adults flying in to feed fledglings gave 200 males to 427 females, the same ratio as above.

These counts probably indicate a real surplus of females, as was found by McIlhenny (1937) for the Boat-tailed Grackle. Some of the apparent surplus, however, may be due to the fact that females apparently mature and nest in one year, whereas at least some males do not breed the first year. A similar condition is suggested by Linsdale (1938) for *Xanthocephalus*. Species of birds with a marked preponderance of females are rare (Mayr, 1939).

Relations of A. tricolor with A. phoeniceus.—Many nests of *A. phoeniceus* were found in colonies of *tricolor*, although it is doubtful whether the former will take up territories after the latter have arrived. A male *phoeniceus* occasionally will chase a male *tricolor*; the reverse was not observed.

SUMMARY

1. The Tricolored Red-wing, *Agelaius tricolor*, is extremely colonial whereas the Red-wing, *A. phoeniceus*, is territorial.
2. In less dense parts of a Tricolor colony each male defends a few square feet from other males, and here it sings and its females nest. Territorial song, fighting and threat display are rather feeble and possibly are absent in crowded areas.
3. Polygamy is the rule; promiscuity possibly occurs at times. The best counts, made during the fledging period, show about 47 males to each 100 females.
4. Males desert their territories during incubation, but return to feed the young.
5. The members of each colony show a marked simultaneity in breeding, whereas neighboring colonies may be in different phases of the reproductive cycle.
6. Mass desertion of nests with destruction of eggs was observed in two instances.

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London, England, and University of California, College of Agriculture, Davis, California, September 10, 1939.

BIBLIOGRAPHICAL NOTES ON DAWSON'S BIRDS OF CALIFORNIA

WITH EIGHT ILLUSTRATIONS

By W. LEE CHAMBERS

Repeated inquiries from librarians, students and book collectors requesting various details concerning the several formats of William Leon Dawson's "Birds of California" prompt the writer to place on record such pertinent facts as have come to his notice incidental to a more or less intimate association with the later marketing of these well known books. It does not lie within his province to indulge in personalia regarding the colorful genius responsible for these sumptuous quartos, but merely to remove, as far as his present knowledge permits, a most annoying stumbling-block in the path of bibliographers dealing with west coast ornithological literature.

Dawson, as is well known, began his publishing career with "The Birds of Ohio" in 1903, after which he moved to the Pacific coast, and in collaboration with J. Hooper Bowles issued in two quarto volumes, in 1909, "The Birds of Washington." The following year he settled in Santa Barbara and with his characteristic energy and zeal began at once to work out a plan larger and more magnificent than any he had yet brought to fruition. This was of course to be "The Birds of California." With assurances that publication would be rushed, the energetic and ambitious author inaugurated a whirlwind campaign for subscriptions to the following proposed "editions:"

*Patrons' Edition De Grand Luxe Super Illustrated (4 vols.): with 16 original watercolor paintings by Allan Brooks bound in.

*Patrons' Edition De Grand Luxe (4 vols.): with 6 original watercolor paintings by Allan Brooks bound in.

Stockholders Edition De Luxe (3 vols.).

Large Paper Edition De Luxe (3 vols.).

*Campanile Edition De Luxe (3 vols.).

*Shasta Edition De Luxe (3 vols.).

Sunset Edition De Luxe (3 vols.).

Booklovers' Edition (3 vols.).

*Ribbed Cloth Edition (3 vols.).

Students' Edition (3 vols.).

The editions marked with an asterisk were later abandoned.

The plan at this time contemplated the issuance of the work in three volumes which were to appear simultaneously, but the author was forced by circumstances to begin issuing it in parts under printed wrappers. Two such parts, which are referred to in detail below, were distributed and paid for on delivery. The author soon awoke to the fact, however, that the limits he had set for himself would be entirely inadequate to accommodate the vast amount of textual and illustrative material available for his harvest, and that subscription prices would necessarily have to be increased to keep pace with the climbing expenditures. This added greatly to the problem that grew constantly more complex and difficult, but it in no way dampened the enthusiasm or checked the ardor of the indomitable Dawson. The present writer was in personal contact with him during the years of his struggle, and he is well aware that few men unsupported by the boundless courage and vision that Dawson brought to his work could have possibly overcome the many obstacles that blocked his path.

The long delay that followed, irritating alike to the author and to his many expectant subscribers, was drawn out to still greater lengths by a confusion of interests, not the least of which was the promotion of a museum dedicated to oology. However, all interests were made to serve the ends of the great work, and ultimately the staggering

accumulation of copy with the enormous array of supporting illustrations and color plates to be made into formats of elegance and luxury placed the enterprise entirely without the pale of commercial possibilities. A real patron of California ornithology, a benefactor of wealth, must be found.

"To Ellen Browning Scripps, lover of the human-kind, and of birds, and of flowers, and of books, patron of science, and of art, and of education, whose steadfast faith has made its publication possible this work is gratefully dedicated." Thus wrote the author out of a full heart of appreciation and gratitude for the limitless generosity that assured the complete realization of his ambitious dream.



Fig. 39. William Leon Dawson, author of "The Birds of California."

In the March, 1913, issue of the *Condor*, the late Harry S. Swarth stated, in a biographical sketch of Dawson, that among the several projects which the Cooper Ornithological Club had pledged itself to support there was probably none of greater general interest than the proposed publication, "The Birds of California," then being so energetically pushed toward completion. The aim of the sketch, aside from presenting the salient facts of the author's life, was to outline the circumstances leading up to the production of the work, as well as to give something of the ideas and ideals with which the author approached his task, and to interpret some of his aspirations as to what the forthcoming book should be. A knowledge of what Swarth wrote at that time is necessary to an understanding of the background of Dawson's activities in California.

No better outline of the progress of the work up to 1921 can be given than that contained in Dawson's own words. He states on page 3 of the wrapper enclosing Part One published in that year: "Part One of 'The Birds of California,' presented herewith, marks a distinct departure from our original publication plans. Instead of three volumes, appearing simultaneously, 'The Birds of California' will come out in standardized parts of 64 pages each, thirty or thirty-two in all, and will make, when assembled, *four* volumes, (three only in the cheapest edition). Upon the completion of twenty-eight of these parts and upon notice that the remainder of the work (including title pages, indexes, etc.), is ready for delivery, the parts already delivered will be recalled for binding and for *such extra equipment of pictorial material* or appendices as each special edition, or copy, calls for. The binding charges and the fees for the final parts will be due and payable at that time.

"This serial method of publication is necessitated not alone by the heavy expense involved (One Hundred Thousand Dollars *in press*, besides field and preparatory costs already met, and binding costs), but rather by the enormous complexities of art production upon such a large scale. The work *cannot be hurried* in press. In fact, we intend to take a great deal more pains in production, especially in the matter of half-tones, than was possible in the case of these two initial parts. We expect, however, to issue eight parts per annum and we may be able to issue as many as twelve, but no more. The MS and illustrative resources of this work are practically complete and all possible diligence will be observed in order to assure continuous and complete production in press . . ."

The distribution of Part Two followed immediately that of Part One, and both bore the imprint, "The Birds of California Publishing Co.," as well as the two lines, "Pub-

lished Under the Patronage of | Ellen Browning Scripps." It is understood from the most reliable sources that five thousand each of these two parts were printed and that this stock was later utilized in the finished volumes. Transcriptions of the wrapper titles of two of the formats follow:

The Birds of California [in red] | A Complete, Scientific and | Popular Account of the 580 Species and Sub-species of Birds | Found in the State | By | William Leon Dawson | of Santa Barbara | Director of the Museum of Comparative Oology, Author of "The Birds of Ohio" | and (with Mr. Bowles) of "The Birds of Washington" | — | Illustrated by 16 Photogravures, 4 Full-page Photographs and More Than | 1000 Half-tone Cuts of Birds in Life, Nests, Eggs and | Favorite Haunts, from Photographs | Chiefly by | Donald R. Dickey, Wright M. Pierce and the Author | Together with 30 Drawings in the Text and a Series of | 48 Full-page Color Plates | Chiefly by | Maj. Allan Brooks, D.S.O. | — | Booklovers' Edition [in red] | Four Volumes | Issued in 64-page Parts and Sold by Subscription | — | Part One | Published Under the Patronage of | Ellen Browning Scripps | — | The Birds of California Publishing Co., | San Francisco | Los Angeles | Santa Barbara | Legal residence | Publishing office | Correspondence | 1921 | All Rights Reserved.

Two parts, superroyal 8vo. Pt. 1, pp. 1-64, text illus. [34] (2 f.p.), pll. [2] (1 col.); Pt. 2, pp. 65-128, text illus. [29] (2 f.p.), pll. [2 col.].

The verso of the front wrapper of each part bears the author's copyright notice and a list of the commercial houses engaged in fabricating the volumes. Page 3 of the wrapper of Part One displays the publisher's announcement transcribed in part above, the other pages of the wrappers of both parts being blank.

The Birds of California [red line] | A Complete, Scientific and | Popular Account of the 580 Species and Sub-species of Birds | Found in the State | By | William Leon Dawson | of Santa Barbara | Director of the Museum of Comparative Oology, Author of "The Birds of Ohio" | and (with Mr. Bowles) of "The Birds of Washington" | — | Illustrated by 30 Photogravures, 30 Full-page Photographs and More Than | 1000 Half-tone Cuts of Birds in Life, Nests, Eggs and | Favorite Haunts, from Photographs | Chiefly by | Donald R. Dickey, Wright M. Pierce and the Author | Together with 30 Drawings in the Text and a Series of | 100 Full-page Color Plates | Chiefly by Maj. Allan Brooks, D.S.O. | — | Format De Luxe | Presentation Edition [in red] | Four Volumes Issued in 64-page Parts and Sold by Subscription | — | Part One | Published Under the Patronage of | Ellen Browning Scripps | — | The Birds of California Publishing Co., | San Francisco | Los Angeles | Santa Barbara | Legal residence | Publishing office | Correspondence | 1921 | All Rights Reserved.

Two parts, med. 4to. Pt. 1, pp. 1-64, text illus. [34] (2 f.p.), pll. [6] (4 col.); Pt. 2, pp. 65-128, text illus. [29] (2 f.p.), pll. [7] (6 col.).

The matter on page 2 of the wrappers of both parts is identical with the 8vo given above; the publisher's announcement on page 3 of the wrapper enclosing Part One is the same as in the 8vo but is set in larger type to conform to the larger space. The outside of the back cover of Part One displays a selected list of subscribers containing 22 names for the Format De Grande Luxe and 184 for the editions in the Format De Luxe, with the statement added that there are 140 others. The corresponding page of Part Two is blank. The writer has been able to check the part issues of only the Presentation and the Stockholders' editions, but all the other quartos are obviously identical with these.

Miss Scripps was so greatly pleased with the appearance and content of these two parts that she decided to obviate further delay by underwriting the entire publication. Thus, the activity of The Birds of California Publishing Company was brought to a sudden end. She placed the management of the costly enterprise in the hands of her own organization, The South Moulton Company, which took over all assets of the old company. A letter was issued over the author's signature recalling the parts distributed, and subscribers were notified that these would be bound in the finished volumes. It is

presumed that this request was pretty generally complied with, as these part issues are of great rarity, the writer having been able to assemble but one set each of the Presentation, Stockholders', and Booklovers' editions.

With unlimited funds at its command the new company now moved briskly forward with the manufacture of the great volumes according to the extravagant specifications of the author and along the lines of the backer's wishes. The entire edition of five thousand copies of all the formats was printed from hand-set type and was run off the press continuously until finished. The printed page of every so-called edition is identical with the corresponding page of every other, having been printed from the same undisturbed forms, and in this vital particular there is of course but one edition. The number of color plates and other full page inserts, the weight and quality of paper used, the dimensions of format, and the design and quality of binding mark the different editions.

A pretentious binding establishment was set up in Los Angeles in charge of a master craftsman imported for the purpose, and the enterprise as a whole was of such magnitude as to attract the attention and interest of the entire typothetae. This story is out of place here, but is a matter of record in various printing trade journals of that time, and the interested reader is referred particularly to the several articles in a special "Birds of California" issue of "The Wolf Howls" (house organ of The Wolfer Printing Company of Los Angeles), vol. II, no. 6, November 21, 1923, and to an anonymous advertising insert of four pages titled "A Real Bookbinding Problem | How oversewing solved it," to be found in one of the numbers of *The Inland Printer* (Chicago) in 1923.

In a discussion of the various formats, particularly in any attempt to bring together a reliable census, a difficulty is encountered in the large "remainder" of stock that passed into the hands of the Claremont Colleges. Thus, there are perfect sets and imperfect sets, original bindings and later bindings, later bindings with the pictorial end papers, and later bindings with plain end papers. The numbers of these remaining copies can now only be approximated; they are indicated below along with the original copies sold by subscription.

When The South Moulton Company began distributing its finished product, the obligations of the Birds of California Publishing Company were liquidated, and each of the early subscribers was furnished with a set of the books in a format commensurate with the amount paid to the old company. If a purchaser had subscribed to one of the formats that was announced but never issued, he was given a corresponding, or even a better, format. Also, in accordance with the wishes of Miss Scripps, every high school and junior college in California, as well as many worthy students and interested friends, were presented with complimentary copies of the book.

During the period of its activity, the South Moulton Company exerted every effort to dispose of the large stock at the original subscription prices, and it prosecuted with some success a vigorous advertising and selling campaign. On the dissolution of the company, and in accordance with the terms of the will of Miss Scripps, who died in 1932, the entire stock of the publication remaining on hand, together with binding paraphernalia, dies, printed end papers, material, etc., became the property of Claremont Colleges, Claremont, California.

In their turn the college authorities tried their hands at marketing the expensive books with but little success until the usual "remainder" method was employed; prices were slashed to such figures as to attract the attention of dealers. Most of the formats were then rapidly disposed of, and at the present time the work may be said to be virtually out of print, there being less than twenty of the more expensive formats held in reserve. All other available sets are in the hands of scattered dealers.

Four thousand seven hundred and fifty copies of all formats of "The Birds of California" were published and can be accounted for. No records are available to indicate the total number printed, although it is safe to assume that the full five thousand copies announced, plus the usual printer's overrun, issued from the press. Since only bound copies and copies sewed ready for binding were inherited by the Claremont Colleges, it is again safe to assume that two hundred and fifty sets in sheets had been destroyed or salvaged as waste. The names of the various formats with the number of each published are as follows:

Students' Edition	2000
Booklovers' Edition	1000
Trade Souvenir Edition.....	35
Format De Luxe [no name, line blank].....	539
Large Paper Edition.....	350
Sunset Edition	350
Santa Barbara Edition.....	100
Presentation Edition.....	50
Stockholders' Edition	75
Patrons' Edition	
Patrons' Inlaid or Raised Leather.....	100
Patrons' Plain	150
The Scripps Copy [unique].....	1
Total	4750



Fig. 40. Dawson's "Birds of California." Four volumes, Booklovers' Edition in green fabricoid; three volumes, Students' Edition in green buckram; both in original binding.

The following collations of these different issues include brief notes on such bindings as have been personally examined by the writer, but a few variants (bound to order) may exist which he has been unable to examine.

The Birds of California [in red] | A Complete, Scientific and | Popular Account of the 580
Species and Subspecies of Birds | Found in the State | By | William Leon Dawson | of Santa

Barbara | Director of the International Museum of Comparative Oology, Author of "The Birds of Ohio" | and (with Mr. Bowles) of "The Birds of Washington" | — | Illustrated by More Than 1100 Half-tone Cuts of Birds in Life, Nests, Eggs, and | Favorite Haunts, from Photographs | Chiefly by | Donald R. Dickey, Wright M. Pierce, Wm. L. Finley and the Author | Together with 44 Drawings in the Text and a Series of | 15 Full-page Color Plates | Chiefly by | Major Allan Brooks | — | Students' Edition [in red] | Complete in Three Volumes | Volume One [- Three] | — | South Moulton Company | San Diego, Los Angeles, San Francisco | 1923 [= 1924] | Sold Only by Subscription. All Rights Reserved.

Three vols, superroyal 8vo (7 $\frac{3}{4}$ x 10 $\frac{3}{4}$ inches). Vol. I, pp. 4 11. (subtitle: name edition; col. frontis.; title.); [i] (dedication), iii-[x] (preface), xi-xv (contents), xvi (explanatory table of comparisons [sizes of birds]), xxvii (list col. plates), 1-696 (text-description species nos. 1-139). Vol. II, pp. [i] (subtitle), [iii] (name edition), 1 1. (frontispiece), [v] (title), vii-xii (contents), xiii (list pl.), [xv] (vol. subtitle and species nos.), 697-1432 (descriptions sp. nos. 140-281). Vol. III, pp. [i] (subtitle), [iii] (name ed.), 1 1. (frontis.), [v] (title), vii-xii (contents), [xv] (vol. subtitle and nos. sp.), 1433-[2063] (description sp. nos. 282-424), [2064]-2096 (analytical keys), 2097-2100 (hypothetical list, [2101]-2121 (index). The illustrative equipment of this issue, as well as of all the others, is sufficiently indicated in its title page.



Fig. 41. Students' Edition, in full leather.

Nearly the entire edition of this popular and best known format (fig. 40) was bound in a heavy green buckram, stoutly put together to insure a long life of hard usage. A panel enclosing the title and a bird design in poster style is printed (not stamped) in three colors on the front, and a like design, though not in poster style, is printed on the spine. The top edge is stained in a dark neutral shade. This is the only issue in which the sets are unnumbered. A few orders were filled for the Students' Edition bound in half and in full leather (fig. 41) in both of which the front cover design was omitted and replaced with a simple lettered display, and gilt replaced the top edge stain. There are two variants of the back strip panelling of the full leather issue. The lining and end papers in all editions, unless otherwise noted, were printed in half-tone from photographs of flocking birds taken by the versatile author. This feature of the book is very striking and most appropriate, and is rendered more pleasing by a matching in each case of the color of printing ink with color of binding. These prints exhibit at once good taste in

the selection of subjects and in pictorial composition, as well as in the delicacy of effect attained in the printing.

The Birds of California [green line] | A Complete, Scientific and | Popular Account of the 580 Species and Subspecies of Birds | Found in the State | By | William Leon Dawson | of Santa Barbara | Director of the International Museum of Comparative Oology, Author of "The Birds of Ohio" | and (with Mr. Bowles) of "The Birds of Washington" | — | Illustrated by 16 Photogravures, 32 Full-page Duotone Plates and More Than | 1100 Half-tone Cuts of Birds in Life, Nest, Eggs, and | Favorite Haunts, from Photographs | Chiefly by | Donald R. Dickey, Wright M. Pierce, Wm. L. Finley | and the Author | Together with 44 Drawings in the Text and a Series of | 48 Full-page Color Plates | Chiefly by | Major Allan Brooks | — | Booklovers' Edition [green line] | Complete in Four Volumes | Volume One [- Four] | — | South Moulton Company | San Diego, Los Angeles, San Francisco | 1923 [= 1924] | Sold Only by Subscription. All Rights Reserved.

Four vols. superroyal 8vo. Vol. I, pp. 4 11. (subtitle; copy no., name ed., name subscriber; frontis.; title;), [i] (dedication, iii-x (preface), xi-xiv (contents), xv (list pll.), xvii (expl. table), 1-522 (description sp. nos. 1-102). Vol. II, pp. [i] (subtitle), [iii] (copy no. and name ed.), 1 l. (frontis.), [v] (title), vii-x (contents), xi (list pll.), [xiii] (vol. subtitle and sp. nos.), 523-1034 (description sp. nos. 103-201). Vol. III, pp. [i] (subtitle), [iii] (copy no. and name ed.), 1 l. (frontis.), [v] (title), vii-xi (contents), xiii (list pll.), [xv] (vol. subtitle and nos. sp.), 1035-1548 (description sp. nos. 202-307). Vol. IV, pp. [i] (subtitle), [iii] (copy no. and name ed.), 1 l. (frontis.), [v] (title), vii-xi (contents), xiii (list pll.), [xv] (vol. subtitle and nos. sp.), 1549-2063 (description sp. nos. 308-422), [2065]-2096 (analytical keys), 2097-2100 (hypothetical list), [2100]-2121 (index).

Being printed on a heavier stock, and carrying a more generous assortment of full-page plates, as will be noted in the above title transcription, the Booklovers' Edition (fig. 40) required four instead of the three volumes of the Students' Edition. It was originally bound in full fabricoid of either a pale green or a straw color, and later in a green keratol. Stamped in high relief on the front cover is a group of western gulls (made directly from one of the author's photographs) enclosed in a double border of straight lines, the whole occupying nearly the entire area of the cover. An inner panel at the bottom displays the title in hand lettering. The design on the spine is from a drawing of a flying gull against conventionalized rays of the sun, and there are small panels at top and bottom carrying title, authorship and volume data. Top edges in this format and in all three following are gilt. As a result of inexpert gathering of sheets and full page inserts for the original binder, many early sets contain extra plates and duplicate pages, and the remaining stock was inadequate at the end of the later binding to form complete sets. Thus one hundred and fifty three sets of the Booklovers' Edition were sold with the understanding that they were incomplete in certain minor particulars.

So intimate had the author's association necessarily been with the printing trades organizations, photo-engravers and others that he saw fit to issue a small edition in the octavo format exclusively for them. He termed this the Trade Souvenir Edition and included in it the choicest of the plates they had manufactured and printed with such matchless skill and success. Only thirty-five sets of this issue were bound and distributed.

The Birds of California [green line] | A Complete, Scientific and | Popular Account of the 580 Species and Subspecies of Birds | Found in the State | By | William Leon Dawson | of Santa Barbara | Director of the International Museum of Comparative Oology, Author of "The Birds of Ohio" | and (with Mr. Bowles) of "The Birds of Washington" | — | Illustrated by 4 Photogravures, 120 Full-page Duotone and More Than | 1100 Half-tone Cuts of Birds in Life, Nests, Eggs, and | Favorite Haunts, from Photographs | Chiefly by | Donald R. Dickey, Wright M. Pierce, Wm. L. Finley | and the Author | Together with 44 Drawings in the Text and a Series of | 76 Full-page Color Plates | Chiefly by | Major Allan Brooks | — | Trade Souvenir Edition | Complete in Four Volumes | Volume One [- Four] | — | South Moulton Company | San Diego, Los Angeles, San Francisco | 1923 [= 1924] | Sold Only by Subscription. All Rights Reserved.

Four vols. superroyal 8vo. (7¾ x 10¾ inches). Vol. I, pp. 5 11. (subtitle; no., ed., subscriber; col. frontis.; title; dedication;), [i] (roster 35 subscribers), iii-x (preface), xi-xiv (contents), xv (list pll.), xvii (expl. table), 1-522; vols. II-IV, pagination identical with Booklovers' Edition.

The same materials and dies used in binding the Booklovers' Edition were employed in making up the Trade Souvenir Edition, and these two editions cannot be told apart on the shelf save by the name stamped in small letters in the panel at the base of the spine.

All the Editions De Luxe are identical as to contents except for a brief paragraph printed on an extra leaf in the front of each Volume I and the name of the edition printed on the title page. Also, the Santa Barbara Edition is alone distinguished by a photograph of the author and the Patrons' Edition contains an engraved insert listing subscribers. A single title transcription will therefore serve for the entire group.

The Birds of California [in red] | A Complete, Scientific and | Popular Account of the 580 Species and Subspecies of Birds | Found in the State | By | William Leon Dawson | of Santa Barbara | Director of the International Museum of Oology, Author of "The Birds of Ohio" | and (with Mr. Bowles) of "The Birds of Washington" | — | Illustrated by 30 Photographures, 120 Full-page Duotone Plates and More Than | 1100 Half-tone Cuts of Birds in Life, Nests, Eggs, and | Favorite Haunts, from Photographs | Chiefly by | Donald R. Dickey, Wright M. Pierce, Wm. L. Finley | and the Author | Together with 44 Drawings in the Text and a Series of | 110 Full-page Color Plates | Chiefly by | Major Allan Brooks | — | Format De Luxe | Large Paper Edition [in red. Sunset Edition. Santa Barbara Edition. Presentation Edition. Stockholders' Edition. Patrons' Edition. No Name—line blank.] Complete in Four Volumes | Volume One [- Four] | — | South Moulton Company | San Diego, Los Angeles, San Francisco | 1923 [= 1924] | Sold Only by Subscription. All Rights Reserved.

Four vols., medium 4to (9½ x 12¾ inches). Vol. I, pp. 4 11. (subtitle; copy no., name ed., name subscriber, statement and sig. author; col. frontispiece; title;), [i] (dedication), [1] 1 only in Santa Barbara Ed. (camera portrait of author), [1] 1 in comparatively few copies (register of subscribers), iii-x (preface), xi-xiv (contents of vol.), xv-xvi (list full-page pl.), xvii (explanatory-table comparisons), 1-522 (description species nos. 1-102). Vol. II, pp. [i] (subtitle), [iii] (copy no. and name ed.), 1 1 (frontispiece), [v] (title page), vii-x (contents), xi-xii (list full-page pl.), [xiii] (vol. subtitle), 523-1034 (description species nos. 103-201). Vol. III, pp. [i] (subtitle), [iii] (copy no. and name ed.), 1 1 (frontispiece), [v] (title, vii-xi (contents), xii-xiv (list pl.), [xv] (vol. subtitle), 1035-1548 (description species nos. 202-307). Vol. IV, pp. [i] (subtitle), [iii] (copy no. and name ed.), 1 1 (frontispiece), [v] (title), vii-xi (contents), xii-xiv (list pl.), [xv] (vol. subtitle), 1549-2063 (description species nos. 308-424), 2065-2096 (analytical keys), 2097-2100 (hypothetical list), [2101]-2121 (index).

First runs from the press, "first issues of the first edition," have always been sought for by collectors, who are willing to pay much higher prices for undisputed early firsts than for any later printing. These desirable and sought for copies often depend for their identification on certain points of the binding alone, and while it may occur to the reader that the first sheets being on the bottom of the pile are last to be bound, Dawson was careful to see to it personally that his book was absolutely right in this particular. The earlier the printing, the better and more expensive the binding. Volume I of every copy of the de luxe issues contains a statement covering this point (indicated above as occupying the second of the extra leaves), reading as follows:

The Scripps Copy | This copy of "The Birds of California," unique | in pictorial content and in binding, consists of | proof-sheets of the *format de luxe* drawn from | press by the author and folded by hand.

The author begs leave to present this concrete | evidence of his wayward gifts to his most gracious | friend and benefactor,

Miss Ellen Browning Scripps

with the sincerest expressions of gratitude and | rejoicing.

Copy No. | Patrons' Edition, De Luxe | Subscribed by | for | This edition comprises the first choice of selected | sheets from the first impressions of the *format de luxe* of "The Birds of California," and its circula- | tion is limited to an approved clientele of 250 names. | [Signed] W. Leon Dawson.

Copy No. | Stockholders' Edition, De Luxe | Subscribed by | for | This edition comprises selected sheets from the | first impressions of the *format de luxe* of "The Birds of California;" and its circulation is limited | to the stockholders of the one-time Birds of | California Publishing Company, or to de luxe | subscribers of record December 31st, 1920. The | edition is specially bound and the number of | copies is limited to the

number (not over 119 [75 issued]) | now fully subscribed. | [Signed] W. Leon Dawson.

Copy No. | Santa Barbara Edition, De Luxe | Subscribed by..... | for | This edition contains early sheets of the exclu- | sive *format de luxe* of "The Birds of California;" | and its circulation is limited to 100 copies. | [Signed] W. Leon Dawson.

Copy No. | Sunset Edition De Luxe | Subscribed by | for | This edition comprises sheets from the first | impressions of the *format de luxe* of "The Birds of | California;" and its circulation is limited to 350 | copies. | [Signed] W. Leon Dawson.

The Author has pleasure | in presenting to | | this copy of his most carefully con- sidered work | and begs to subscribe himself | Your devoted friend | | The "Presenta- tion Edition" comprises fifty copies | of the *format de luxe* of "The Birds of California" re- | served by the author for his personal dispositions. [The author evidently changed his mind and used other formats as gifts, as the entire edition of 50 copies passed to Claremont.]

Copy No. | Large Paper Edition, De Luxe | Subscribed by | for | This edition completes the output of the *format de luxe* of "The Birds of California;" and com- | prises 350 copies. | [Signed] W. Leon Dawson.



Fig. 42. Large Paper Edition De Luxe.

The quarto issue referred to in the foregoing title transcription as having no name represents the use by the legatees of a supply of title pages which had not been finished by the printer. All titles were designed to emphasize the lines "The Birds of California" and the name of the edition by printing them in colors contrasting sharply with black; bright red or green were used in the 8vos, and bright red in all the 4tos. The entire edition of titles was run off the press at one time, and as the lines in color were added only as needed to keep pace with bindery demands, there remained at the end a quantity of unfinished titles. This stock was utilized in making up 539 sets for the "remainder" market, and among these sets are volumes deficient in other particulars aside from the incomplete titles. A total of 323 sets of the later binding of *all* the formats are defective in lacking pages or plates, or both, or in unmatched title pages (that is in showing different edition names), but no detailed record was kept of the number of each format

in this category. Nor is any record available of the number of sets bound after the supply of pictorial end paper was exhausted, though a few hundred are known to contain plain lining paper of a shade to match the covers.

The large issue of this edition without name was all sewed, glued and made ready for the covers but was never completed. This remainder was sold to the general public at a very low price.

The Large Paper Edition (fig. 42) was bound originally in very pale green paper on extra heavy binder boards, with plain printed paper labels. This was a rather distinguished looking dress, but proved impracticable on two counts; it soiled easily, and it was too weak to stand the strain of so heavy a book. Only a few copies were delivered, all the rest of the 350 sets being given later the full green keratol.

The Sunset Edition (fig. 43), one of the most popular of the expensive formats, occurs in two distinct types of binding in several colors of material. The three-quarter burnished levant in a deep shade of either blue, brown or violet on heavy, beveled boards, with plain gold lettering on the back strip, was the choice of many early subscribers because of its simple dignity and good taste. The second type is more ornate



Fig. 43. Sunset Edition De Luxe, in one-half leather.

and is in full fabricoid of a deep wine red, with a large semicircular panel stamped in relief on the front enclosing a seascape design containing a gull in flight against the setting sun. The same motif is carried out on the back strip. The few remaining copies were bound in exactly this same style, but the material was full keratol in pale green.

Nearly the entire issue of the Santa Barbara Edition was absorbed by original subscribers. The edition was richly bound in keeping with the tastes of wealthy collectors. It was done in three-quarters crushed levant in either green, brown or blue of subdued shades, and was decorated on the back strip with three birds, one of which was stamped, the other two (identical) being hand-colored inlays. These inlays repre-



Fig. 44. Stockholders' Edition De Luxe, in full leather.

sent a different species of bird on each of the four volumes of a set and are authentic portraits. The small remaining stock of this issue was later bound in the full keratol stamped with the Sunset dies. Dawson evidently used this format largely for personal copies, as it alone contains his portrait (a fine photographic print in sepia), and the



Fig. 45. Patrons' Edition De Luxe, Plain, in full morocco.

entire issue of the Presentation Edition, designed for this purpose, reached the legatees in unbound sets. These were handled in the same manner as were all the others.

It cannot be found from the voluminous advertising matter that the South Moulton Company ever solicited subscriptions to the Stockholders' Edition (fig. 44), but many Cooper Club members subscribed to and were supplied with this format. It was done in full levant of a deep brown color, and none remained for later binding.

Most pretentious and most expensive of all the formats offered the public were the two of the Patrons' Edition. Both were executed in full crushed levant of any color or shade desired by the subscriber, but only the Patrons' Plain (fig. 45) is subdued as to tooling and ornamentation. This format, with its rich material and simple luxuriance of design, cannot fail to satisfy the most exacting demands of good taste. This is not to say that the Patrons' Inlaid is in bad taste, far from it, but merely that many discriminating book buyers prefer embellishments only in the text, and Dawson could and did satisfy all tastes. The spine panels are separated in both issues by inlaid bird figures of the most skillful workmanship; three sets of species alike on each volume of the Plain, and the same figures on each volume of the Inlaid. Another feature distinguishing the Inlaid Edition (fig. 46) is the presence on the front cover of an authentic bird portrait hand carved in half relief from a block of hardwood. This bird, colored by hand and of a different species on each volume of a set, is in such high relief that with the similar five conventional carvings on the back cover it makes it impossible to shelve the book except in the four-compartment corduroy-lined slip cases that were provided. These massive decorations are so firmly inlaid or anchored to the covers as to appear virtually as parts of them. While there is no denying that this format is a masterpiece of binding craftsmanship, it is far too bulky for easy or comfortable handling.

It has not been the writer's privilege to examine the unique Scripps copy, but on reliable information it can best be described as a museum piece, and as typifying about all that modern binding masters are capable of producing. Lately it has been understood



Fig. 46. Patrons' Edition De Luxe, with carved figures of birds; in full leather.

that another copy of almost equal magnificence was made for one of the other early patrons, but this has not been verified.

Some time after the book had been on the market, and while the subscription campaign was in full swing, Dawson informed the writer that a total of \$250,000 had been expended, which may have included the heavy expense he had been put to in extensive field trips for life history material and photographs. Over half of this amount came from Miss Scripps, and it is certain that her only thought in connection with her part was that it be a cultural and artistic gift to posterity, as others of a like nature had been. Let posterity, then, judge of the true worth of the book, and if the matter here recorded can add any value to the final summation of data, so much the better.

It may be said in conclusion that the book obviously occupies an utterly unique place in modern American ornithologica, and that no contemporary will deny Dawson the full credit due him for an amazing achievement.

Eagle Rock, California, June 9, 1939.

THE RED-WINGED BLACKBIRDS OF THE CANADIAN PRAIRIE PROVINCES

WITH ONE ILLUSTRATION

By P. A. TAVERNER

The Red-winged Blackbird currently ascribed to Manitoba, the prairie provinces and the Canadian Northwest Territory is the Giant Red-wing, *Agelaius phoeniceus arctolegus* Oberholser (Auk, vol. 24, 1907, p. 332). It is characterized by the describer as larger than the Eastern Red-wing, *A. p. phoeniceus*, with a heavier (thicker?) bill; the female is very slightly paler than in that form, but there is no color distinction in the male. The measurements given in the original diagnosis are quite convincing. Of the twenty-two male specimens, which are about equally divided between the two races, only two *A. p. phoeniceus* have wings longer than 4.8 inches (121.9 mm.), and there are no *arctolegus* with wings under that figure. The bills of all the *phoeniceus* are .9 inches (22.8 mm.) or under, whereas of *arctolegus* two are barely under this figure, three equal it, and the rest are well above it. The bill of *arctolegus* is inferred to have the same "thick-billed" character as *fortis* and to be heavier than in *phoeniceus*.

The following fully adult males from actively breeding associations have been available to me for comparison. Geographically they represent *arctolegus* as originally defined.

Alberta	Manitoba
2 Red Deer River	1 Thicket Portage
1 Edmonton	5 The Pas neighborhood
8 Lac la Nonne	1 Garland
2 Jasper Park	3 Swan River
1 Chipewyan	5 Riding Mountain
8 Buffalo Park	4 Dauphin
8 Mackenzie Valley, from figures in original description	2 Oak Lake
	3 Whitewater Lake
	2 Douglas
Saskatchewan	8 Shoal Lake, north of Winnipeg
1 Indian Head	
5 Cypress Lake	70 Total

These seventy males were compared with forty-seven breeding males from southern Ontario, from Point Pelee to Ottawa, that were assumed to be *phoeniceus*. The measurements of ten birds ascribed to that race in the original diagnosis of *arctolegus* also were used.

For the purpose of visual comparison of size, the wing and culmen measurements of each specimen were taken with dividers and transferred directly to cross-section paper. These were plotted from a common base line, the paper being punctured with the extended divider leg to give accurate transference of the measurements. The results showed that while the mid-western group did average larger in both measurements than the eastern one, individual variation largely obscured the difference. By assembling the measurements in a condensed graph, figure 47A was obtained in which the horizontal distances from the base line at the left show the lengths of bills and wings and the perpendiculars the numbers of individuals having similar measurements.

It will be seen from this graph that the bulk of the two groups have similar bill and wing measurements, but that there are more large individuals in one group and more small ones in the other. Thus, the respective averages are appreciably different. Of 54 *arctolegus*, only 13, or 24 per cent, fall beyond the maximum of *phoeniceus* in wing length, and only 11, or 20 per cent, in bill length.

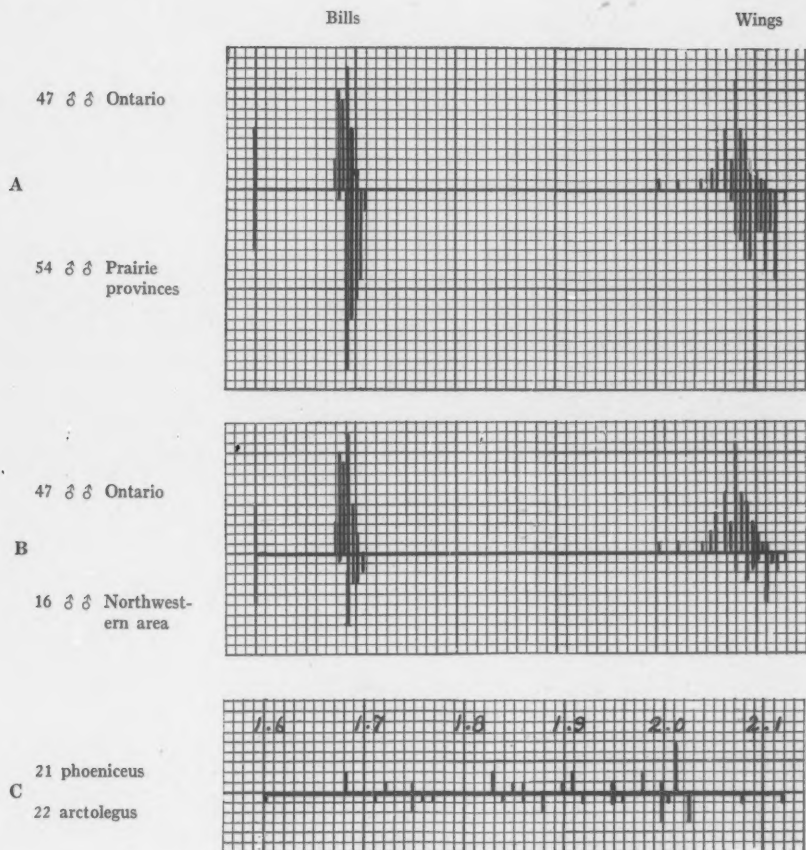


Fig. 47. A and B, graphs showing lengths of bills and wings in Red-wing Blackbirds. Lengths of vertical lines above or below horizontal line indicate numbers of individuals, the height of a square representing one individual. Distances of vertical lines from base line at left represent measurements; one square equals $\frac{1}{40}$ inch. C, indexes of bill size (see text).

Of 47 *phoeniceus*, only 15, or 22 per cent, are smaller than the minimum of *arctolegus* in wing length and 3, or 6 per cent, in bill length.

Of 101 specimens, only 28 can be subspecifically recognized by wing character, and 14 by bill size.

Another feature that has been stressed as a distinguishing character of *arctolegus* is a comparatively heavy or thick bill. To reduce this character to a measurable quantity, twenty-one *phoeniceus* and twenty-two *arctolegus* were carefully measured and the depth of each bill was divided into the length, thus giving an index of bill proportion irrespective of gross size. The larger the resultant quotient, the more slender

is the bill. These indexes, when plotted (fig. 47c), show that thickness of bill practically disappears as a factor in identification. It will be noted that not only are bill indexes promiscuously scattered, but that both the thickest and the thinnest bills are represented in the supposedly thick-billed strain.

On the possibility that mid-western birds (Manitoba and Saskatchewan) represent a heterogeneous or intergrading group and that a more purely differentiated strain might be found in more northern areas, nearer the type locality of *arctolegus* (Fort Simpson, Mackenzie River), sixteen specimens from Chipewyan, Wood Buffalo Park, and northward, were selected. These included northern specimens used in the original description of that race. This group was compared with the series of *phoeniceus* from the east (fig. 47b). *Arctolegus* here appears quite as unsatisfactory as in the comparison employing the larger geographic group.

Similar examination of equivalent series of females of the two proposed races produced practically identical results. In color, mid-western females may average slightly paler than eastern ones. But, there are so many exceptions and reversals as to make color an unreliable, if not misleading, criterion of racial affinity.

From these considerations it is evident that while the mid-western group of red-wings to which the name *arctolegus* has been applied average in series rather larger than those of eastern areas (*phoeniceus*), the name "Giant Red-wing" is a gross exaggeration. The racial size distinction is not marked enough or constant enough for the confident recognition of any individual out of its known geographical range. Therefore, in the opinion of the writer, *arctolegus* should not be accorded formal subspecific recognition and should be dropped from our lists.

National Museum of Canada, Ottawa, Canada, September 15, 1939.

BREEDING BIRDS OF MONO COUNTY, CALIFORNIA

WITH FIVE ILLUSTRATIONS

By J. STUART ROWLEY

For some reason, little has been written on the birds of Mono County, California, in the heart of the high Sierra. It has been my good fortune to spend short periods of time at the height of the nesting season in this country in each of several years, as follows: May 14 to 23, 1926; July 2 to 9, 1927; July 4 to 9, 1930; June 15 to 18, 1938; July 2 to 6, 1939. Although this time was extremely limited, it afforded opportunity to observe at varying elevations from near 6000 to above 12,000 feet. The area offered a wide variety of material, often within a few hours of travel.

The habitats which my notes cover range from marshy meadowlands at about 6000 feet, up through the higher sage country, bordered by a few scattered pines, through the aspen thickets at 7500 to 8500 feet and through the heavy timber, to the rocky barren country well above timberline at approximately 13,500 feet. Thus, the nature of the country made it seem advisable to establish a permanent camp midway between the lower and higher areas for convenience. By deciding on a particular course for each day, a fair survey at the various altitudes was obtained. Generalizing, one might say that Mono County extends from the desert floor to the highest peaks in California, but our searches were only in the upper levels, with no field work lower than 6000 feet. In 1926 and 1927, I was accompanied by the late O. W. Howard and in 1930 by W. J. Sheffler.

Mallard. *Anas platyrhynchos*. On May 15, 1926, in the marshy country adjacent to Owens River and McGee Creek, two nests of this common breeder were found, containing 14 and 9 heavily incubated eggs. Young were evident throughout the area, the majority being not over two weeks old. Locating the nests was difficult and had it not been for Howard's pointer dog, we would undoubtedly have failed to flush the close-sitting females. Both nests were heavily lined with down and placed in grasses at the bases of scrub willows.

Western Goshawk. *Astur atricapillus striatulus*. Two nests were found by accident in the Virginia Lakes country, the first on July 3, 1927, about 9000 feet elevation. The female raised such an uproar of screams when I came into sight while fishing that my suspicions were aroused immediately. She came screaming over my head with fierce animosity, topping me by fifteen or twenty feet. After each swoop, she perched on some well-situated pine stub and watched my reaction to the attack. When I withdrew from the vicinity, she remained perched, but when I approached closer, a swift, fierce swoop was made, accompanied by continual screaming. Finally, the nest was sighted about forty feet up in a lodgepole pine. Howard ascended the tree, and when he was almost to the nest, the female became frenzied and made many close swoops at him. When he reached the side of the nest, the female swooped down and tore his shirt and undershirt, and made a long scratch across his back just below the shoulders. The nest contained three half-grown young on this date. This was the first instance either of us had witnessed of an actual "strike" by a bird of prey while inspecting nests. The strike may have been a misjudged flight, but the indications were that it was quite deliberate.

Another nest was found at about 8000 feet elevation on July 7, 1927, situated only fifteen feet up in an aspen in a thicket and well concealed by branches. It contained three half-grown young, also. In this case, however, neither parent was present during the time of inspection nor was either heard. Both nests were about the same in construction, being about the size of a small nest of a Western Red-tailed Hawk. One was made of pine sticks, the other mostly of aspen branches. The actions of the pairs seemed to indicate a rather wide range in temperament in this species.

In July 1930, both pairs apparently were established, for an immature youngster having downy feathers on the head was found resting near the ground, within a thousand yards of the old nest in the aspen thicket. A comparison of notes indicates that seasonal conditions and temperatures affect the nesting period of these hawks at this elevation, since half-grown young in 1927 and a flying youngster in 1930 were found on closely corresponding dates.

In 1939 the nest in the aspen was definitely abandoned, but the one in the lodgepole pine was occupied. The female was brooding young that were visible from the ground after she was flushed. Both parents were noisy and characteristically hostile to intruders, as they had been when the nest was found twelve years earlier. This tends to indicate that this pair has a limited foraging range during the breeding season and that this range is guarded from year to year. I have no proof that the pair breeding twelve years ago is the same which occupied the nest this year, but the longevity of birds of prey is well known and the conclusion is not at all improbable.

Sparrow Hawk. *Falco sparverius*. On May 19, 1926, a nest in a cavity of a dead pine was found on Convict Creek. No attempt was made to chop out the hole, so we did not determine whether it contained eggs or young.

Sage Hen. *Centrocercus urophasianus*. On July 7, 1927, we came upon a pair of these birds with four half-grown young on the road below Virginia Lakes. In the other years, no Sage Hens were seen in this section. In 1939, on the public highway near McGee Creek, four birds, flushed in strong flight, sailed out over the meadows. These appeared to be adult birds, for on July 6 birds of the year would not be of full size.

Virginia Rail. *Rallus limicola*. On May 15, 1926, in the marshes near McGee Creek, three nests of this rail were found, containing 7 and 9 fresh eggs, and 10 newly-hatched downy young. Here again the dog was helpful in flushing the females, as all three nests were exceedingly well concealed in grasses. This species was rather abundant, and no doubt many other pairs nested in the vicinity.

Wilson Snipe. *Capella delicata*. In the McGee Creek marsh this species was uncommon, but one nest found by Howard on May 15, 1926, contained the remains of eggshells, the young having left. Although this was the only nest found, eggs were undoubtedly present, for males were seen in courting flight.

Spotted Sandpiper. *Actitis macularia*. On July 5, 1927, at an elevation of 9000 feet, two pairs were quite concerned at our presence along the gravel bank of Virginia Creek. Search revealed two nests, each containing four heavily-incubated eggs. The four birds were excitable during the time of our search. No sandpipers were seen anywhere in the territory covered in other years.

Wilson Phalarope. *Steganopus tricolor*. Immediately adjacent to the rail nest with young we watched several pairs of phalaropes occupied in breeding activities. Two nests were found, both in the process of construction, as was evident by the actions of the birds. The birds were little concerned by our presence and we could approach within a few yards of them.

Long-eared Owl. *Asio wilsonianus*. On May 22, 1927, two nests of this bird were found in the willows along Convict Creek, one containing half-grown young and the other newly-hatched young. Both pairs chose old magpie nests situated in willows about twelve feet above the ground. A perfect specimen of pocket mouse (*Perognathus parvus olivaceus*) was found in the nest containing small young.

Short-eared Owl. *Asio flammeus*. On May 19, 1927, Howard, with the aid of his dog, located a nest of this species in the marsh grass in the meadow near McGee Creek. It held six fresh eggs, the nest being placed on the ground with no concealment; it was in the open sunlight exposed to the heat of midday.

Calliope Hummingbird. *Stellula calliope*. My records show this species to be well distributed throughout the country we traveled. On May 22, 1926, a nest was found in the process of construction at an elevation of about 7000 feet in an aspen thicket. On July 7, 1927, several nests were found containing young ranging from small ones to those nearly ready to leave the nest. No nests were more than ten feet from the ground, the average being about six feet. In the five years, fourteen nests were found, all on parallel, dead aspen twigs with the exception of two on dead twigs of pines. Also, all nests had a protecting branch a few inches directly overhead, presumably as a shelter from summer showers and heat. These birds were abundant around the scrub willows of the high meadows near Virginia Creek in July of 1939 when they were observed feeding extensively from the drillings of sapsuckers.

Red-shafted Flicker. *Colaptes cafer collaris*. At Convict Lake on May 21, 1927, a nest was found containing seven half-incubated eggs. This was the only nest we found, but calls were heard nearly every day.

Sierra Red-breasted Sapsucker. *Sphyrapicus varius daggetti*. On Mammoth Creek on July 16, 1938, young in a nest in a cavity in a live aspen could be heard "whistling" for food, and both parents were kept busy carrying food.

Williamson Sapsucker. *Sphyrapicus thyroideus*. On July 8, 1930, within one hundred yards of our camp near Virginia Lakes at 9000 feet, a nest with young was found in a dead lodgepole pine



Fig. 48. Nest and eggs of Western Wood Pewee; June 4, 1939, Virginia Creek, Mono County, California.

about twenty feet from the ground. Because the parents continually carried food to the cavity, no attempt was made to excavate the nesthole or to disturb the brood in any way.

Cabanis Woodpecker. *Dryobates villosus hyloscopus*. This bird was met with wherever a good stand of pine timber was available. At a nest near Virginia Lakes in a dead pine stub, on July 3, 1939, the parents were feeding noisy young.

Northern White-headed Woodpecker. *Dryobates albolarvatus albolarvatus*. This species was well represented at Virginia Lakes in 1939. Several nests were found within a mile of camp, but on July 4 all contained young of various ages.

Wright Flycatcher. *Empidonax wrightii*. Many nests near water, either in lodgepole pine or aspen, were found, all within eight feet of the ground. On Virginia Creek, at 10,000 feet, a nest containing four advanced eggs was found on July 5, 1930, and one ready for eggs on July 5, 1927.

Western Wood Pewee. *Myiochanes richardsonii richardsonii*. The first week of July at 9000 to 10,000 feet seemed to be the height of the nesting season for this bird. Two dozen or more nests were found in the five seasons, all on dead branches of lodgepole pine or aspen about twelve feet from the ground and close to running or standing water. No nests contained more than three eggs or young (some with two) except one with four fresh eggs (fig. 48) found July 4, 1939, near Virginia Creek.

Violet-green Swallow. *Tachycineta thalassina lepida*. These birds were breeding around Virginia Lakes, but seemed to prefer the holes near the tops of the tallest and rottenest old pine stubs in the vicinity. Consequently, no nests were examined to determine seasonal breeding activity.

Barn Swallow. *Hirundo erythrogaster*. One solitary pair was building a nest on May 22, 1926, in a colony of Cliff Swallows. The nest was barely started on this date.

Cliff Swallow. *Petrochelidon albifrons albifrons*. Incomplete sets of eggs only were noted in a large colony nesting under a bridge on May 22, 1926, at about 6000 feet on Convict Creek.

American Magpie. *Pica pica hudsonia*. This bird nested in the willows at about 6000 feet near Convict Creek and McGee Creek. Two nests were found on May 19, 1926, one containing nine advanced eggs and the other seven half-grown young. A nest of Long-eared Owl was situated some fifty yards from the nest containing eggs, occupying probably the previous year's nest of this pair of magpies.

Clark Nutcracker. *Nucifraga columbiana*. These birds were seen in family flocks. Several would perch near the top of a pine, and the youngsters of the year would commence a clamor for food. If no food was in the offing, the parents would fly to another tree where the performance started anew.

Near Virginia Creek on July 4, 1939, I tapped a dead pine stub and was surprised to see several nearly fledged young chickadees "explode" in my face and fly uncertainly down a ravine. Immediately, two nutcrackers swooped down, concentrating their attack on one individual. One nutcracker seized the fledgling, whereupon it flew to a pine and proceeded to pick off feathers from the tail and wings of the chickadee before tearing it to bits and devouring it.

Short-tailed Mountain Chickadee. *Penthestes gambeli abbreviatus*. In the Virginia Creek area on July 4, 1939, a dozen or more nests were found, all containing young nearly ready to leave. Apparently all the chickadees at a given elevation begin egg laying within a day or so, for the many cavities inspected near Virginia Lakes held young of practically the same size.

Western House Wren. *Troglodytes aedon parkmanii*. Five nests were found on July 7, 1927, all within a half-mile radius in an aspen thicket at 8500 feet along Virginia Creek. Two nests contained five and six eggs, one nest held two eggs, the fourth was incomplete and nearly ready for eggs, while the fifth held four newly-hatched young. At no other place did we observe House Wrens as commonly as here, where the five pairs formed a regular colony.

Sage Thrasher. *Oreoscoptes montanus*. On May 19, 1926, Howard found a nest about two feet off the ground in *Artemisia tridentata* near Whitmore's Tubs. It contained five nearly-hatched eggs. This was the only nest found.

Western Robin. *Turdus migratorius propinquus*. From May 14 to 23, 1926, many nests, all in aspen trees, were found around the 6000-foot mark near Convict Creek, ranging from nests being constructed to ones with half-grown young.

Sierra Hermit Thrush. *Hylocichla guttata sequoiensis*. On July 5, 1927, near Virginia Lakes, Howard found a nest containing four heavily-incubated eggs, and on the same day I saw young flying about and being fed by the parents. In 1930, on July 7, I found a nest with two fresh eggs, an incomplete set with the female still laying. Young were flying about camp at around 9000 feet elevation on July 6, while the incomplete set was found the next day at about 8000 feet in aspens.

Mountain Bluebird. *Sialia currucoides*. One nest, found by Howard on July 6, 1927, contained five fresh eggs. Another nest, found by Sheffer on July 7, 1930, contained four young, three-fourths grown. Both sites were approximately at 9000 feet elevation near Virginia Lakes. The third site was different, being in a niche in the side of a cliff at approximately 12,000 feet, and some miles from the nearest timber. The female was seen with the aid of field glasses and was taken to be a Rosy Finch leaving a nesting cranny. The nest held four newly-hatched young on July 8, 1927.

On July 3, 1939, near Virginia Creek, a cavity was chopped out and a set of five fresh eggs collected. While the female was starting to incubate these eggs, the male was occupied feeding nearly fully fledged and independent young flying about the nest stub.

Western Ruby-crowned Kinglet. *Corthylio calendula cineraceus*. Around Virginia Lakes, the breeding range of the Ruby-crowned Kinglet is limited to lodgepole pine stands, above 8500 feet elevation. Over the five seasons of search for nests, only three were found. The first was some sixty feet up in a lodgepole pine, well concealed in the needles. This nest, on July 7, 1927, contained only one fresh egg although the female was flushed from the nest in midday. A second nest was found the next day, containing six heavily-incubated eggs; it was placed not more than twenty feet from the ground. The third nest found on July 6, 1930, was about forty feet up in a lodgepole pine and contained seven heavily-incubated eggs (fig. 49).

Each was discovered by patiently watching and following females at feeding time early in the morning or late in the evening. At each location, the male kept a vigilant guard against intruding birds of other species, making furious darts at casual passing robins, warblers, and the like. By locating a singing male, one could assume that a nest was near, but to find it was another matter.

All three nests were made of lichens and pieces of bark, tied together with cobwebs. The linings were chiefly of feathers. The persistence of incubating females in remaining on the nest is quite remarkable for such a shy nester. In our experience, the females left the nest reluctantly, one remaining until I was a foot or so from the nest. None of the three females flew farther away from their nests than twenty feet when inspection was going on.



Fig. 49. Nest and eggs of Western Ruby-crowned Kinglet;
July 6, 1930, Virginia Lakes.

The actual climbing to two of the three nests was done by the use of ropes. The third and last nest found was simpler to reach, but the former two were reached only after a rope was tied to the main trunk of the tree above the nest location and in a similar way to an adjacent tree, necessitating going out on the rope to the nests, much in the same manner as one might hang to a clothesline forty to sixty feet above ground.

California Yellow Warbler. *Dendroica aestiva brewsteri*. Along the aspen- and willow-bordered sides of Mammoth Creek on July 17, 1938, this warbler was a common nester, several nests being found containing fresh eggs on this date.

Audubon Warbler. *Dendroica auduboni auduboni*. In the Virginia Lakes area this bird was well distributed. A lodgepole pine a few yards from camp was a nesting site for a pair which had nearly full-grown young on July 4, 1939.

Tolmie Warbler. *Oporornis tolmiei*. This warbler was met with rarely, no doubt because of its retiring habits. On July 16, 1938, in the aspen area along Mammoth Creek, two nests were found, each containing four fresh eggs. The nests were well concealed in weeds and were just a few inches from the ground. None was seen at higher elevations around Virginia Lakes.

Golden Pileolated Warbler. *Wilsonia pusilla chryseola*. On July 7, 1927, we found several nests close to creek beds and in thick foliage in aspens along Virginia Creek. Nests were found ranging in contents from one with one fresh egg to full sets and newly-hatched young, and young were seen flying about. The average elevation was 8500 feet.

A nest found here on July 3, 1939, contained three warbler eggs and two eggs of the Nevada Cowbird. Judging from the markings of the two cowbird eggs (fig. 50), I believe them to be from the same individual female. This nest was the only one seen in 1939 whereas in previous years they were well distributed. This fact I attribute to extensive, and in my opinion, excessive overgrazing by sheep throughout the area in 1939, which destroyed nest cover and food supply.

Nevada Red-wing. *Agelaius phoeniceus nevadensis*. Red-wings were nesting plentifully close to the Wilson Phalaropes near Whitmore's Tubs. On May 19, 1926, several nests containing fresh eggs were found a few inches above the wet marsh and securely fastened to upright grasses.

Brewer Blackbird. *Euphagus cyanocephalus*. Two nests, placed on the ground, each contained five fresh eggs, one being at the foot of an aspen in the grass near the shore of Mono Lake and the other in a few overhanging weeds at the foot of a clump of meadow grass on a bank of a meadow stream near June Lake. Both were found in May, 1926, at about the 7000-foot mark.

Nevada Cowbird. *Molothrus ater artemisiae*. I have not seen a single cowbird anywhere in the high country on any of the trips and the only instance of its presence was the discovery of the Pileolated Warbler nest containing the two cowbird eggs previously mentioned.

Cassin Purple Finch. *Carpodacus cassinii*. On July 7, 1930, near Virginia Lakes, Sheffler found a nest about fifty feet up in a lodgepole pine. The nest contained five heavily-incubated eggs (fig. 51), and I found one the next day with two fresh eggs about eight feet up in an aspen. In July, 1939,



Fig. 50. Nest of Golden Pileolated Warbler containing two eggs of Nevada Cowbird; July 3, 1939, Virginia Creek.

several nests in lodgepole pines near camp at Virginia Lakes contained young about half-grown, except for one that was being built; no eggs were found.

Sierra Nevada Rosy Finch. *Leucosticte tephrocotis dawsoni*. The locating of a nest of this bird was one of the main incentives for our field work. The canyon surrounding Virginia Lakes in which we were camped was walled on three sides by precipitous cliffs, well above 12,000 feet. Observations had disclosed that daily at about four o'clock numbers of these birds would descend from the cliffs to feed in the canyon at about 10,000 feet. On July 8, 1927, Howard and I made our way to the summit of the range in search for a nest. Our search was not without reward, as is often the case when hunting leucosticte nests, for the dog flushed a female from a rock slide. She acted differently than others which were flying about, and after a careful watch with binoculars, I saw her disappear under a rock in a sloping moraine to the westward. She was again flushed, the exact spot noted, and the nest was disclosed some sixteen inches in under a loose slab of granite. The nest contained four eggs. The female was very uneasy while we set up our camera and in a few minutes became so anxious to return to the nest that she approached close to us. I judge that the nest site was at an altitude of about 11,500 feet, and since there was much snow there then, she stayed on the nest practically all of the time. This individual was the only female leucosticte observed on this trip. In the evening during the feeding flights to the bottom of the canyon, several specimens were collected. All proved to be breeding males, with crops filled with seeds and small insects including a small water bug from along the creek. This food was mostly taken from snowdrifts where the frozen insects covered the surface. Since no females were detected at this evening feed, we concluded that they were all on nests on the high crags, and that because of the cold atmosphere there and the long flight to the feeding grounds, the males were coming down to the creek-bed feeding grounds and carrying food to the nests on the ridges. No young birds were seen flying on this date.

Northern Pine Siskin. *Spinus pinus pinus*. On July 6, 1927, a nest was found some forty feet up in a pine near Virginia Lakes. It contained young ready to leave. This was the only nest of this species noted in the five seasons; it was found at about 9000 feet elevation.



Fig. 51. Nest and eggs of Cassin Purple Finch; July 7, 1930, Virginia Lakes.

Green-tailed Towhee. *Oberholseria chlorura*. One nest, ready for eggs, was found on May 22, 1926, in a sage bush two feet from the ground, about 6000 feet elevation, along Convict Creek. On June 17, 1938, on Mammoth Creek, a nest was found on the ground by a fallen log. It contained two eggs which hatched the next day.

Nevada Savannah Sparrow. *Passerculus sandwichensis nevadensis*. Howard took a set of eggs from a marshy place at about 6000 feet elevation near Convict Creek, and I found a nest containing four eggs and another with three fresh eggs at the same time. The birds were quite common on May 19, 1926, in this marsh, having nests on the ground in natural depressions well concealed by grasses.

Western Vesper Sparrow. *Pooecetes gramineus confinis*. On July 8, 1930, a nest was found containing three eggs with incubation commenced. The nest was made of sage twigs and bark, placed at the foot of and under the protection of a scrubby sage bush growing close to the ground. The altitude at this point was about 8000 feet, and the nest location was on a sloping hillside of sagebrush about twelve miles northwest of Mono Lake. These birds were quite abundant when sought out, but the cold penetrating winds from the higher snow capped peaks caused them to seek shelter in the sage and unless one observed carefully, they could easily be passed by.

Thurber Junco. *Junco oreganus thurberi*. On July 6, 1930, Sheffler found a nest containing four young nearly ready to leave at about 9000 feet near Virginia Lakes. The next day I located another in the lower country in the aspen area containing four nearly fresh eggs. Juncos are common breeders in this country throughout the summer.

Western Chipping Sparrow. *Spizella passerina arizonae*. This is a common nester in the area, and while no eggs were collected, many nests were found, particularly in the Virginia Lakes area at around 9000 feet. On July 3, 1939, a nest was found near here placed on a low horizontal branch of a lodgepole pine; it contained two half-grown young.

Brewer Sparrow. *Spizella breweri*. One nest of this bird was found in a small *Artemisia tridentata* bordering the aspen thickets near Convict Creek at an elevation of about 6000 feet. It contained three eggs that were ready to hatch on May 17, 1926. Many individuals were seen in the higher sage belt above 8000 feet but no more nests were found.

White-crowned Sparrow. *Zonotrichia leucophrys leucophrys*. On July 9, 1927, a nest with four fresh eggs was found near Virginia Lakes. The nest was of typical *zonotrichia* make and was placed on a topped tree which had started sucker shoots about the cut. On July 6, 1930, a nest in the meadow grass a few hundred yards away also contained four fresh eggs (fig. 52). On this same date, Sheffler found young flying about and being fed by the parents. The species is a very common nester in the high wet meadowlands.



Fig. 52. Nest and eggs of White-crowned Sparrow; July 6, 1930, Virginia Lakes.

Mono Fox Sparrow. *Passerella iliaca monoensis*. Our observations showed this bird to be very seclusive in its breeding habits, inhabiting the thickly-covered creek beds and wet meadowland. On July 9, 1927, I stumbled across a well-concealed nest containing three fresh eggs. The female flushed without sound from my feet and only the dark movement of the "sneak" was noted. The nest was placed at the base of a small fallen aspen log in the center of a growth of wild delphinium. On July 6 of the same year adults were observed feeding young flying about. The nesting elevation was about 8500 feet along Virginia Creek.

A peculiar nest site was found on Mammoth Creek in June, 1938, the nest being about twelve feet from the ground behind a piece of bark of a leaning dead pine stub. It contained one egg nearly ready to hatch.

Lincoln Sparrow. *Melospiza lincolnii*. One nest was found in a marshy patch of grass at 10,000 feet close to timberline near Virginia Lakes. On July 6, 1930, the nest held four newly hatched young.

There seems to be a distinct "vacant zone" for song sparrows in Mono County. *M. m. fisherella* ranges to about 6000 or 6500 feet elevation, while *M. lincolnii* ranges from the 9000- to the 10,500-foot mark. According to my observations, there are no nesting song sparrows here between these elevations.

Modoc Song Sparrow. *Melospiza melodia fisherella*. At 6000 feet along Convict Creek several nests were found, ranging from nests with sets of eggs to those with young ready to fly on May 22, 1926. No song sparrows were found along the streams upward from this elevation, all apparently concentrating in favorable feeding and nesting grounds in the meadows of this lower zone.

Alhambra, California, August 31, 1939.

FROM FIELD AND STUDY

The Western Gnatcatcher as a Nest Mover.—In 1938 Mr. J. D. Graham, of Benicia, and I found ten nests of Western Gnatcatchers (*Poliophtila caerulea amoenissima*) near Cordelia, Solano County, California.

We are convinced that reports such as made by Chamberlin (Condor, vol. 3, 1901, pp. 33-36) of this species removing nests from one location to another are true and that this is a characteristic and commonly practiced custom. A nest found with one egg on May 21 was completely gone on May 29 and there was no trace of it either on the limb or under the tree. A careful survey led us to believe it was removed, piecemeal of course, to another site, although it is a matter of conjecture what happened to the egg. With little doubt another pair which was putting the finishing touches on their nest on May 29 moved their nest, as there was no trace of it a week later. I watched a pair of these birds on June 5 busily tearing apart a gnatcatcher's nest and flying away with parts of it. My efforts to locate what was possibly a new site were unsuccessful as they traveled to a distant point. It occurred to me that jays might have destroyed some of our missing nests; Dawson (Birds of California, 1923, p. 815) suspects that "fully half" of the gnatcatcher nests are robbed or torn up by jays. With little doubt jays bother gnatcatchers as well as other birds during the nesting season. However, I do not believe jays would take every vestige of nesting material from a nesting site. Cobwebs and downy materials adhere to the limb even when a nest is carefully removed by hand, and in the case of our missing nests the limbs on which they had rested bore not a single web or trace of down. It would seem that a jay would have no interest in so completely destroying a nest, whereas the busy little original owners might easily be suspected of transferring every treasured bit of home-building material to another location.—EMERSON A. STONER, *Benicia, California, August 23, 1939.*

White-winged Dove in Santa Cruz County, California.—On July 18, 1939, a White-winged Dove (*Melopelia asiatica*) was seen in Larkin Valley, about five miles west of Watsonville, Santa Cruz County, California. The bird was perched on a wire beside the road, where it remained until we got out of the car. It was closely and carefully observed, both at rest and in flight, by myself, Dr. Laurence M. Dickerson and Mr. A. C. Hawbecker. There was no question as to the identity of the bird, but it may, of course, have been an escape. The nearest records of occurrence of this species seem to be at Twenty-nine Palms, San Bernardino County (Heller, Condor, vol. 3, 1901, p. 100; Carter, Condor, vol. 39, 1937, p. 85; at Escondido, San Diego County (Dixon, Condor, vol. 14, 1912, p. 196); and in Santa Barbara (Parmenter, Condor, vol. 25, 1923, p. 107). Mr. Hawbecker has seen the bird several times during the subsequent month. The identification of the bird is so certain that he has not tried to collect it.—R. M. BOND, *Soil Conservation Service, Berkeley, California, September 5, 1939.*

July Records from San Pedro, California.—On July 23, 1939, while the writer and his wife were cruising on the ocean a few miles off San Pedro, California, a number of terns were seen and tentatively identified as the Common Tern (*Sterna hirundo*). As the earliest fall date previously recorded for this species in southern California is August 13 (Willett, Pac. Coast Avif., No. 21, 1933, p. 76), it seemed worth while to substantiate the July occurrence by a specimen. Consequently the locality was revisited July 25, with the result that several of the terns were again encountered and an adult female collected. As expected, it proved to be *S. hirundo*. A few minutes before the tern was secured, two Rhinoceros Auklets (*Cerorhinca monocerata*) were seen and one (a male) was shot, this also being a first record for July. The above two specimens are in the Los Angeles Museum.

Shortly after we had started for port, and while still about five miles out, an adult Pomarine Jaeger (*Stercorarius pomarinus*) crossed our bows in pursuit of a tern. Although this bird was not collected, it was seen so clearly that the twisted tail feathers were plainly visible. This is an early date for the species in southern California.—G. WILLETT, *Los Angeles Museum, Los Angeles, California, August 29, 1939.*

Foraging Dexterity of a Lazuli Bunting.—Instances of foraging behavior that are especially adapted to meet particular physical situations are numerous indeed among birds. Less frequent are occasions when an element of learning, in contrast to instinct, is clearly manifest in feeding technique carried on in the wild. We may be confident of the adaptability of birds in general in seeking their food, but when actions are nicely gauged to take advantage of some unnatural object in the environment, we are the more assured of the individual's powers of comprehension and adjustment.

On August 3, 1939, Dr. Ernst Mayr and I watched a male Lazuli Bunting (*Passerina amoena*) that had learned a handy method of feeding on grass heads. The bird was first noted as it flew along the roadside in Strawberry Canyon, Berkeley. It alighted on the barbed wire fence ahead of our car and began feeding at once. Canary grass (*Phalaris californica*) grew to a height of 20 to 26 inches and thus extended above the lowest fence wire which was 18 inches above the ground. This species of grass appears to have insufficient rigidity to support a bunting on the tips of its stems. The bunting flew laterally from the wire to a distance of about one foot, seized a grass head in its bill and returned with it to the wire, the grass stem bending over readily. The bird then lowered its bill to the wire and clasped the compact seed head against the wire with its left foot. In this position it picked out the seeds. When the head was well broken apart and the seed supply depleted, the grass stem either slipped free or was allowed to spring back to its normal position. Immediately the bird flew out for another grass head, hovered and returned, and the feeding was continued. This activity was seen at least six times in succession, the foraging taking place to either side of the wire. The bunting seemed able successfully to gauge the distance to which it could operate. Tall grasses no more than 15 inches away always were taken. At no time did it fail through attempting to bend over a head that was too short or one that was too far away.

The fence for 100 feet passed through grass of similar height and maturity. Undoubtedly the bird had lived in or about this vicinity during the current summer and had developed, to its special advantage, this method of feeding from the fence wire.—ALDEN H. MILLER, *Museum of Vertebrate Zoology, Berkeley, California, October 12, 1939.*

Four Species New to Grand Canyon National Park.—Since publication of the "Check-list of Birds of Grand Canyon National Park" in July, 1937, four species new to Grand Canyon have been recorded. All of these were observed in 1939.

About 3 p.m. on February 12, I found a Western Tree Sparrow (*Spizella arborea ochracea*) sitting on a clump of burro brush about one-half mile above Indian Gardens. The place marked the lower limit of the snow at that time. I was able to approach within fifteen feet of the bird and to observe it for several minutes. To my knowledge the only other record of this species from northern Arizona is that listed by Swarth (*Pac. Coast Avif.*, No. 10, 1914, p. 54) which was reported by Kennerly from the Little Colorado River in December, 1859.

A Rocky Mountain Pigmy Owl (*Glaucidium gnoma pinicola*) was discovered in a ponderosa pine by Mrs. H. C. Bryant, about one-half mile east of Grand Canyon village on April 25. Attention was drawn to the owl by the calls of Long-crested Jays. Later, on the same day, Dr. H. C. Bryant, Mrs. McKee and I all had opportunity to see the owl where it sat about thirty feet above the ground. A few days later its nest hole was found by Mrs. Bryant in a neighboring pine and on June 4, when I revisited the site, this hole was still being used. Furthermore, about ten feet below it, a hole of



Fig. 53. Young Saw-whet Owls; south rim of Grand Canyon, Arizona.

Photo by A. L. Brown.

similar appearance was being used by a Black-eared Nuthatch, and five feet still lower was another occupied by a Red-shafted Flicker.

On April 28, a *Phainopepla nitens lepida* was seen by Mr. A. T. Sevey flitting about among willows and arrowweeds in Lower Pipe Creek Canyon near the Bright Angel Trail. It was observed for about twenty minutes at close range. This species, which is common in the Lower Sonoran Zone in some parts of Arizona, has not heretofore been recorded from the Grand Canyon.

The fourth species new to Grand Canyon is the Saw-whet Owl (*Cryptoglaux acadica acadica*), first seen by rangers A. L. Brown and Perry Brown on June 2 near Hearst Tank, at the National Park boundary about three miles south and east of Grandview Point. At this time four young birds, barely able to fly and with tails still undeveloped, were found near together, one on the ground and three about ten feet up in a ponderosa pine. On several subsequent days these young owls were revisited. Not all of them could be located on any one of these days, but at least two were always in the vicinity. Although they would usually fight one another when placed close together, they could be handled easily and were photographed many times at close range. Only two previous state records of this species are known, one from the San Francisco Mountains (Mearns, Auk, vol. 7, 1890, p. 54) and the other from the Chiricahua Mountains (Miller, Condor, vol. 39, 1937, p. 130).—EDWIN D. McKEE, Grand Canyon, Arizona, June 15, 1939.

Killdeer Nest Sites.—On June 16, 1938, I found the nest of a Killdeer (*Oxyechus vociferus*) with four eggs, in the middle of the main-line tracks of the Denver and Rio Grande Railway west of Centerville, Utah. I again visited it on the 18th, taking a friend to photograph it. On my next visit, nineteen days later, the nest was empty, but there was no indication of destruction of either eggs or birds.

In front of the New State Gun Club's house, Davis County, Utah, is a cinder fill through which some stubby salt grass struggles for existence. A roadway to the porch circles this area, which is twenty feet in diameter. Dogs, cats, children, and autos are ever present, but this spot has served as home for a pair of Killdeers for eight seasons according to the custodian's son, Bill Bader. I have noted the nest myself for several seasons, and on May 18, 1938, the first egg had just hatched. In the middle of the one-way road to the clubhouse were several nest excavations, two of which held one and four eggs, respectively.

On another part of the club property I found a full clutch of Killdeer that had been laid in a slight excavation in wet mud. Only a few salicornia stems lined the nest. Twenty feet away in contrast, and possibly with a show of better judgment, an Avocet had erected a platform fully six inches high on which to lay her eggs.—C. W. LOCKERIE, Salt Lake City, Utah, April 15, 1939.

Migration Records at Sea.—Information on coastwise or oceanic movements of land birds is sufficiently scarce to justify recording a few observations on birds seen on their autumn passage when I was a passenger on the *Aorangi*, Australia-bound from Vancouver, B. C., in September, 1938. The vessel left Vancouver on September 28 and we passed through the Strait of Juan de Fuca that night. On the following day numbers of land birds alighted on the ship, with lesser numbers thereafter, and near the Hawaiian Islands flocks of migrating Golden Plover were encountered. The following log gives details of the occurrences.

September 29. Position at noon, latitude 46° 18' N, longitude 129° 02' W; 278 miles from Victoria and 2067 miles from Honolulu. At 8 p.m. the ship was 411 miles from Victoria. The ship began to roll moderately after midnight, but conditions were fair all day. The sky was overcast. In the morning a party of Black-footed Albatrosses (*Diomedea nigripes*) was following the ship; they remained in evidence the whole day, though there were fewer in the afternoon. The main feature of interest, however, was the number of land birds resting on the vessel's decks. The most numerous was the Savannah Sparrow (*Passerculus sandwichensis*). Several birds were seen flying over the water like storm petrels and a number rested for quite a while on the boat deck, aft. Several were tame, evidently because of exhaustion, and I was able to catch one and handle it. The supercilious stripe, lores and medial crown stripe were quite yellow. The coloration was distinctly brighter than that of the form nesting in the Seattle region (*P. s. brooksi*) and I felt that the birds belonged to the Aleutian breeding race, *P. s. sandwichensis*. The birds were seen up till noon but there was none in the afternoon. At 5 p.m. a small sparrow alighted on deck, but I could not get near enough to identify it before it disappeared.

With the Savannah Sparrows, at 11 a.m., were two large sparrows which apparently were Golden-crowns (*Zonotrichia coronata*).

Robins (*Turdus migratorius*) were prominent. In the morning they were seen in pairs and singly, flying to the ship and perching on the deck, until noon. One approached the ship's side shortly before

5 p.m. and a little later it, or another, made a further approach, and though it overhauled the vessel, made apparently no effort to alight.

A juvenal Lutescent Warbler (*Vermivora celata lutescens*) was found about 10:30 a.m. huddled on a hatch on the deck. It was asleep with its head tucked under the wing and made no effort to resist being handled. It was so exhausted that it slept in my hand. It was replaced in a sheltered spot and an hour later was still there, and apparently weaker. It was collected and proved to be a male.

September 30. Position at noon, latitude $41^{\circ} 58' N$, longitude $136^{\circ} 24' W$; day's run 410 miles, 688 miles from Victoria and 1657 from Honolulu. At 8 p.m. the ship was 821 miles from Victoria. Weather rougher this morning with white horses. Slight rain falling. As the day wore on the swell increased but the white horses subsided.

At 8:30 a.m. a pair of Savannah Sparrows was noted on the deck. They looked wet and rather bedraggled. Later I saw three about, in bright plumage, and these haunted the deck all the morning. At 1 p.m. an obviously tired bird was seen on deck and another was seen in the late afternoon. Passengers at deck sports disturbed the birds no doubt, but their greatest concern was the ship's cat which was reported to have taken several birds. I recovered a sparrow from the cat in the evening and turned it into a skin. The specimen was later forwarded to the Museum of Vertebrate Zoology at Berkeley (no. 74942), where Dr. Grinnell and Dr. Miller confirmed its identification as *P. s. sandwichensis*.

One Robin was seen during the morning.

October 1. Position at noon, latitude $37^{\circ} 03' N$, longitude $142^{\circ} 29' W$; 1096 miles from Victoria and 1249 from Honolulu. At 8 p.m. the ship was 1231 miles from Victoria. Weather mild.

At 8:30 a.m. two Savannah Sparrows were seen alighting on the ship and they began searching the deck for food. They were rather active. One bird was seen again at 10 a.m. No Robins were seen this day.

October 2. Position at noon, latitude $32^{\circ} 01' N$, longitude $148^{\circ} 05' W$; 1505 miles from Victoria and 840 from Honolulu. No passerine migrants were noted.

October 3. Position at noon, latitude $26^{\circ} 27' N$, longitude $153^{\circ} 00' W$; 1911 miles from Victoria and 434 from Honolulu. At 8 p.m. the ship was 300 miles from Honolulu.

At 9 a.m. a sparrow was seen flying alongside and at 1 p.m. a very richly-coloured Savannah Sparrow was noted on the promenade deck, aft. It had a distinctly rufous back. The bird was active and wandered into the ship's laundry on one occasion. This was the last time the species was seen on the voyage.

The first Golden Plover (*Pluvialis dominica*) were seen at 4 p.m., after which several parties, ranging from twelve to twenty birds, were noted. They were flying very rapidly and in various directions. Some were heading northwest, others southeast, and still others changed directions.

October 4. Tied up at Honolulu at 2:30 p.m.; Oahu was sighted from the deck about 10:45 a.m. At 9 a.m. a flock of Golden Plover, twelve to twenty strong, passed us going in the same direction. At 10:50 a.m. another party also overhauled us.

It appears that the ship passed through a fairly thick migratory flight of Savannah Sparrows that was following the coastwise migration route (Lincoln, U. S. Dept. Agric. Circ. No. 363, 1935, map. 21, p. 40) and that outlying birds may fly or become blown off this course for hundreds of miles out into the Pacific. It is conceivable that odd individuals might occasionally get as far out as the Hawaiian Islands, but as far as I know there are no records of this. At first sight the specific name of the birds gives color to this suggestion, but Coues (Key to North American Birds, 5th ed., vol. 1, 1903, p. 405) explains the name *sandwichensis*, as "of the Sandwich, one of the Aleutian Islands."

Lincoln, in the publication just referred to, gives the transpacific migration route of the Pacific Golden Plover as trending southeast toward the Hawaiian group, but the *Aorangi* encountered flocks about 370 miles northeast of the islands. That the (occasional?) deflection to the eastward may be even greater at times is indicated by the California-taken specimen reported by Grinnell (Condor, vol. 38, 1936, p. 219).—D. L. SERVenty, Marine Biological Laboratory, Cronulla, New South Wales, June 5, 1939.

Chipping Sparrow in the Rancho La Brea.—In a recent issue of the Condor (vol. 41, 1939, pp. 126-127) appeared an article by the present writer giving the identity of several fringillid maxillae from the Rancho La Brea Pleistocene. A specimen of the genus *Spizella* was tentatively referred to *S. passerina*. Certain identification at that time was impossible because skeletons of *S. atrogularis* were not available for comparison with the fossil. Recently, however, five complete skeletons of *S. atrogularis* have been added to the collections of the Museum of Vertebrate Zoology.

Study of these reveals that the maxilla of *S. passerina* differs from that of *S. atrogularis* in being more slender and acuminate with tomlia slightly concave when viewed dorsally; it is narrower in the

prenasal region and weaker in general appearance. The fossil closely resembles *S. passerina* in these respects and is now referred to that species. The specimen is U. C. Mus. Vert. Paleo. no. 34745.

The specimens previously described have also been catalogued. Their numbers are: *Spinus pinus* 34741; *Spinus tristis* 34742; *Amphispiza bilineata* 34743; *Amphispiza belli* 34744; *Spinus* sp. 34746. —CHARLES G. SIBLEY, Museum of Vertebrate Zoology, Berkeley, California, August 17, 1939.

The Brown Thrasher in New Mexico.—On November 24, 1938, Mr. Lawrence V. Compton and I observed a Brown Thrasher (*Toxostoma rufum*) in a thicket along the Rio Grande, four miles north of Albuquerque, New Mexico. The bird was wary and remained in the heaviest cover. Later the same day we returned to the site and collected the bird which proved to be an adult male. Dr. Joseph Grinnell identified the specimen as belonging to the western race, *longicauda*, which race has been resuscitated by Oberholser in his recent book, "The Bird Life of Louisiana." The specimen, bearing field number A.E.B. 6087, has been deposited in the Museum of Vertebrate Zoology, Berkeley, California, and furnishes the first record of this species in New Mexico.—ADREY E. BORELL, Soil Conservation Service, Albuquerque, New Mexico, September 5, 1939.

Nesting Habits of the Red-breasted Nuthatch.—On the morning of May 13, 1939, while on a bird walk near the Clark Fork of the Stanislaus River at an elevation of 5500 feet, Tuolumne County, my attention was attracted by a persistent pounding, which, after a few moments, I traced to a hole in a dead red fir stub where a Red-breasted Nuthatch (*Sitta canadensis*) was busily building its nest. The bird seemed not to mind my presence at all, but pounded away inside the cavity, appearing periodically at the entrance to throw out bill-fuls of chips. The chips were so fine that they blew away in the wind like sawdust. Once, after pounding, the nuthatch appeared at the entrance hole eleven times, and each time threw out sawdust. The nest tree was in an open forest, with yellow pines, red firs, and incense cedars predominating. The nest was only about fifteen feet above the ground and the entrance faced east; the entire circumference of the hole was liberally smeared with pitch.

Due to an unseasonable rainy spell, it was five days before I returned to the nest, but on May 18 I found both birds at the nest at 8 a.m. The male was uttering scolding notes, like those of a Bewick Wren, and his feathers were so ruffled that he looked as if he had just taken a bath and had preened them vigorously. Actually, this was not the case, for I saw him in a similar condition repeatedly. Construction was still in progress. When the male came to the entrance to scold, or to throw out chips, he braced himself with one foot on either rim of the entrance hole, head downward, in typical nuthatch posture. Often he called from a tiny twig just above the entrance hole, filling the air with his nasal honking. When thus perched, he sat very erect, lifting the head and depressing the tail in the manner of a singing sparrow. The female, for the most part, remained silent and out of sight.

On May 31, the male was still throwing out very small puffs of sawdust, hopping in and out of the nest, scolding and ruffling his feathers, but I never once saw the female actually at work on the nest. She seldom appeared and when she did, she remained silent.

Due to the location and nature of the nest, I was unable to ascertain when the eggs were deposited, how many eggs the female laid, or the exact date on which incubation began. However, by June 6 the female definitely was incubating and I made detailed observations from 8 to 11 a.m. and from 1 to 4 p.m. On June 7, I observed from 11 a.m. to 1 p.m.; on June 8, from 6 to 8 a.m. and on June 19, from 4 to 6 p.m.

From these observations, it was learned that the female alone incubated; she left the nest only during the warmer hours of the day and was fed by the male at other times. The male never fed the female more than three times an hour, and he did not approach the nest without calling, except during the early morning hours when his comings and goings were silent. As he approached, his notes increased in frequency, but he did not bring food with him. He flew either to the nest tree or to some tree close by, called, and then flew off to forage, later to return with his offering.

The female's exits and entrances were so swift and so silent that I had to watch the entrance hole constantly to note them. In the twelve hours of observation she left the nest for periods of 9, 17, 20, 33, and 40 minutes, the longest absence occurring when the nest received the most sunlight (between 10:20 and 11:00 a.m.).

On June 24 I first noted the parent nuthatches feeding young, and on July 5 I observed the activity at the nest for three hours. Both parents entered the nest to feed, whereas the male always fed the female during incubation from outside the nest. Both perched on twigs either on the nest tree or on a nearby tree before flying into the nest and both invariably poked their heads out of the entrance hole immediately after entering. Insects were still in their bills when their heads reappeared. The adults poked their heads out several times during a two or three second period of feeding.

I was unable to ascertain what insects these nuthatches fed their young, but I saw the male bring a long, jointed green worm, a long white worm, and a white-winged insect. One day, as I was attempting to photograph the nest, a Slender-billed Nuthatch (*Sitta carolinensis aculeata*) flew to the entrance hole and peered in, and another day a Douglas squirrel came head-first down the tree and poked his nose inside.

The young nuthatches left the nest on July 7. We then chopped down the fir stub and found that the hole was 6 inches deep and free of lining of any sort. There was a deep layer of fine sawdust on the bottom, however, and again I noticed the liberal coating of pitch around the entire circumference of the hole.—ANITA GUNDERSON, *Dardanelle, Tuolumne County, California, August 4, 1939.*

Some "Butcher-bird" Activities of the California Shrike.—The California Shrike (*Lanius ludovicianus gambeli*) is known in my vicinity as a canary killer. A caged canary placed out of doors on the porch for sunshine and air is an invitation to our numerous butcher-birds to "come and get it."

Some types of banding traps offer similar opportunities to shrikes. I have observed on several occasions that my W.B.B.A. two-compartment trap has received the attention of butcher-birds. Not always, however, will the object of the shrike's attention become victimized. A shrike may simply look in interestedly on a trapped bird from alongside or from the top of the trap, causing intense freight to its occupant.

A few specific instances occurring in Benicia, California, show that shrikes are attracted to birds in banding traps. On October 24, 1932, I caught a shrike in one compartment of a trap while a Nuttall Sparrow (*Zonotrichia leucophrys nuttalli*) was in the other compartment. On November 1, 1936, I caught a shrike in one section while a Golden-crowned Sparrow (*Zonotrichia coronata*) was the occupant of the other section. On January 21, 1937, a shrike killed a Nuttall Sparrow through the

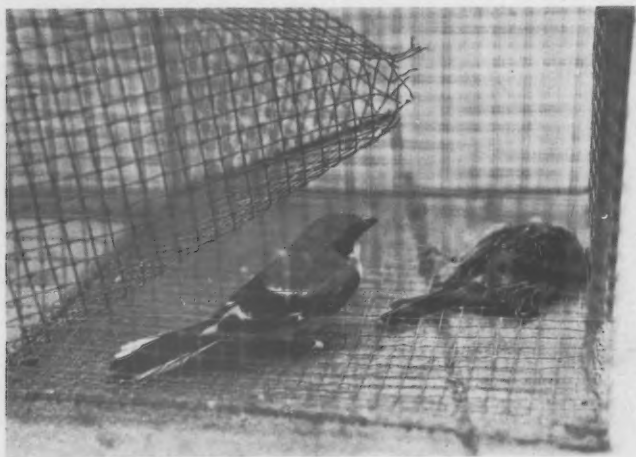


Fig. 54. California Shrike in banding trap with its victim, a Golden-crowned Sparrow; March 27, 1939, Benicia, California.

bars of a trap, and in an endeavor to get the bird out of the cage, the shrike was captured in the adjoining compartment. This season I added a government sparrow trap to my banding equipment into which on March 27, 1939, a California Shrike entered and killed a Golden-crowned Sparrow (fig. 54).

Although a bird lover dislikes this killing of visitors to his traps, I have to date banded and released these avian butchers.—EMERSON A. STONER, *Benicia, California, August 21, 1939.*

NOTES AND NEWS

An essay contest, open to all nature lovers, has recently been announced by Claremont Colleges, California. The contest is part of a project to foster interest in the study of nature and to encourage an appreciation of beauty and other values in nature as a force in noble living. Manuscripts should be of suitable length for magazine publication, but should not exceed 3000 words, and must reach the judges before February 1, 1940. Three cash prizes are offered: first prize, \$100; second, \$75; third, \$50. Each essay should consist of an original study of some subject in nature and should embody the appreciation of such factors as beauty, strength, form, and variation. Drawings or photographs should be used if possible. Complete information concerning the contest may be obtained by writing the John Muir Nature Enterprise, Room 100, Harper Hall, Claremont, California.

MINUTES OF COOPER CLUB MEETINGS

SOUTHERN DIVISION

JULY.—About 75 members and guests assembled for the regular monthly meeting of the Southern Division of the Cooper Ornithological Club held at the Los Angeles Museum on Tuesday, July 25, 1939. The meeting was called to order by President Peyton at 8:20 p. m.

The minutes of the Southern Division for June were read and approved. One application for membership was read: Robert Cyril Stebbins, Van Nuys, California, proposed by Loye Miller.

The secretary mentioned receipt of a letter from the Catalina Island Company inviting the Cooper Club to take advantage of special group rates to the island.

A letter from Mrs. Grinnell was read, in which she thanked the Southern Division for the wreath of flowers sent as a tribute to the memory of Joseph Grinnell.

The scheduled program of the evening comprised two reels of moving pictures of the sea otters off the coast of Monterey County. One reel, in black and white, was taken by Dr. Guy Rukke of Monterey, the other, partly in color, by Mr. J. R. Pemberton. Mr. Pemberton showed the films and made a few comments on the habits of the otters.

After the pictures, the meeting was open for questions and observations. Dr. Miller gave a resumé of a recent two weeks' voyage off the Mexican coast. Mr. Willett reported upon some birds seen off the coast of southern California a few days before and Mr. Brode discussed some birds seen on a trip into the southern Sierra.



Fig. 55. A. Brazier Howell, member of the Cooper Ornithological Club for 31 years, who assisted in placing the Club on a firm financial basis in the middle years of its history; contributor of many articles in the *Condor* and of a masterly review of the avifauna of the islands of southern California (*Pac. Coast Avif.* No. 12, 1917).

Photograph by Bachrach.

Mr. Peyton announced that the program of the next meeting would be "The Life-history of the Long-billed Curlew," by Mr. Bennett.

Adjourned.—HILDEGARDE HOWARD, *Secretary*.

AUGUST.—The monthly meeting of the Southern Division of the Cooper Ornithological Club was held at the Los Angeles Museum on Tuesday, August 29, 1939, at 8 p. m. Mr. Peyton presided and there were about 60 members and guests present.

The minutes of the Southern Division for July were read and a correction made in the title of the paper announced for the August meeting.

Five applications for membership were read, as follows: Mrs. Ruth Wheeler, Angwin, California, proposed by Milton S. Ray; J. Laurence Murray, 115 N. Mayo Ave., Compton, California, by George G. Cantwell; Raymond F. Conway, care Feather River Logging Camp, Delleker, California, by Mrs. N. Edward Ayer; and Clifton M. Greenhalgh, 1230 E. 1st South, Salt Lake City, Utah, and Paul S. Bartholomew, U.S. Forest Service, Santa Barbara, California, both by W. Lee Chambers.

The resolutions of the Club regarding the loss of "its most revered and distinguished member," Joseph Grinnell, were read from the July minutes of the Northern Division. The Southern Division followed the Northern Division in unanimously endorsing these resolutions.

Mr. Willett announced that one of the recent maps of Southern California records "Pemberton Peak" in the middle of Santa Barbara County, where Mr. Pemberton has been studying the California Condor.

The program of the evening was given by Mr. Walter W. Bennett. His subject, "Siyo," or the Life of the Prairie Chicken, was presented largely by illustration—colored lantern slides, and motion pictures. The motion pictures traced the life of the Prairie Chicken from the booming and "dancing" of early spring, through all the vicissitudes of caring for the eggs, to the final hatching of the brood of chicks and their leaving the nest shortly thereafter.

Adjourned.—HILDEGARDE HOWARD, *Secretary*.

NORTHERN DIVISION

AUGUST.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on Thursday, August 24, 1939, at 8:00 p. m., in Room 2503 Life Sciences Building, Berkeley, with President Emlen in the chair and 46 members and guests present. Minutes of the Northern Division for July were read and approved. Names proposed for membership were: Frank D. Fanning, P. O. Box 32, Safford, Arizona, by Lawrence V. Compton; and Verl Lee House, 2022 Bancroft Way, Berkeley, by Henry S. Fitch.

Three persons presented the main part of the program, which was devoted to summer field notes. Joe T. Marshall, Jr., speaking on birds of the Blue Mountains in southeastern Washington, demonstrated the method of night observation by means of a headlight with pocket batteries. This method enabled him to determine accurately the habitat of the Flammulated Screech Owl as the open park type of forest. On the night of July 20, accompanied by his brother, he walked down the trail from Lake Tenaya to Mirror Lake in Yosemite Valley, confirming his previous observations and correlating the habitat with the owl's foraging methods, which resemble those of the flycatchers.

Charles G. Sibley summarized a season's observations in the central Sierra Nevada, an area representing all life zones except Lower Sonoran. His work centered at Dutch Flat, in the Transition Zone, with trips to Desolation Valley, Pyramid Peak, and Carson Valley, Nevada. He noted the different stages of the breeding cycle within the same species at different altitudes, a phenomenon well illustrated by the Western Wood Pewees. Although extremely low precipitation is

generally considered to be detrimental in its effects on bird populations, Mr. Sibley hazarded speculation as to two possible compensating factors. Mild weather might result in lowered mortality and hence a larger breeding population for the next season. The possibility of early breeding might allow for completion of the cycle before the effects of excessive dryness were felt.

Mr. Richard M. Bond gave notes from Lincoln County, in southern Nevada, which is so confusing zonally as to present such occurrences as the Snowy Plover in creosote bush association. Many studies were made of the nesting of birds of prey. At a small spring in the Lower Sonoran Zone, literally "acres of doves" were seen, the question being whether the number should be estimated at 10 or only 5 thousand.

Adjourned.—FRANCES CARTER, *Recording Secretary*.

SEPTEMBER.—The regular monthly meeting of the Northern Division of the Cooper Ornithological Club was held on Thursday, September 28, 1939, at 8:00 p. m., in Room 2503 Life Sciences Building, Berkeley, with President Emlen in the chair and over 150 members and guests present. Minutes of the Northern Division for August were read and approved. Names proposed for membership were: Floyd E. Durham, 2593 Life Sciences Building, University of California, Berkeley, and Frank Alois Pitelka, Department of Zoology, University of California, Berkeley, both by Alden H. Miller. There was no further business to come before the club.

The speaker of the evening was Mr. Harry M. Bourland, of the Eastman Kodak Company, who presented "Some Birds of California," in colored motion pictures. For several years Mr. Bourland has been preparing a library of pictures on California birds, mammals and wild flowers. Some of the early work is being replaced with the superior film now available. It is Mr. Bourland's ambition in the study of birds to obtain complete series for each species, including adults, nest with eggs and young.

Large flocks of ducks and geese were shown feeding and in flight. Views of adult male and female Sandhill Cranes, with nest and eggs, were particularly good, as were slow motion shots of many adults in flight. A Bald Eagle was seen in altercation with a Red-tailed Hawk. The Screech Owl, Pigmy Owl and Burrowing Owl made an interesting series, while close-ups of a Great Horned Owl blinking in the sun proved highly entertaining. The California Condor was shown in its habitat.

Ornithologists can look forward with great expectation to the results of Mr. Bourland's continued work.

Adjourned.—FRANCES CARTER, *Recording Secretary*.

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